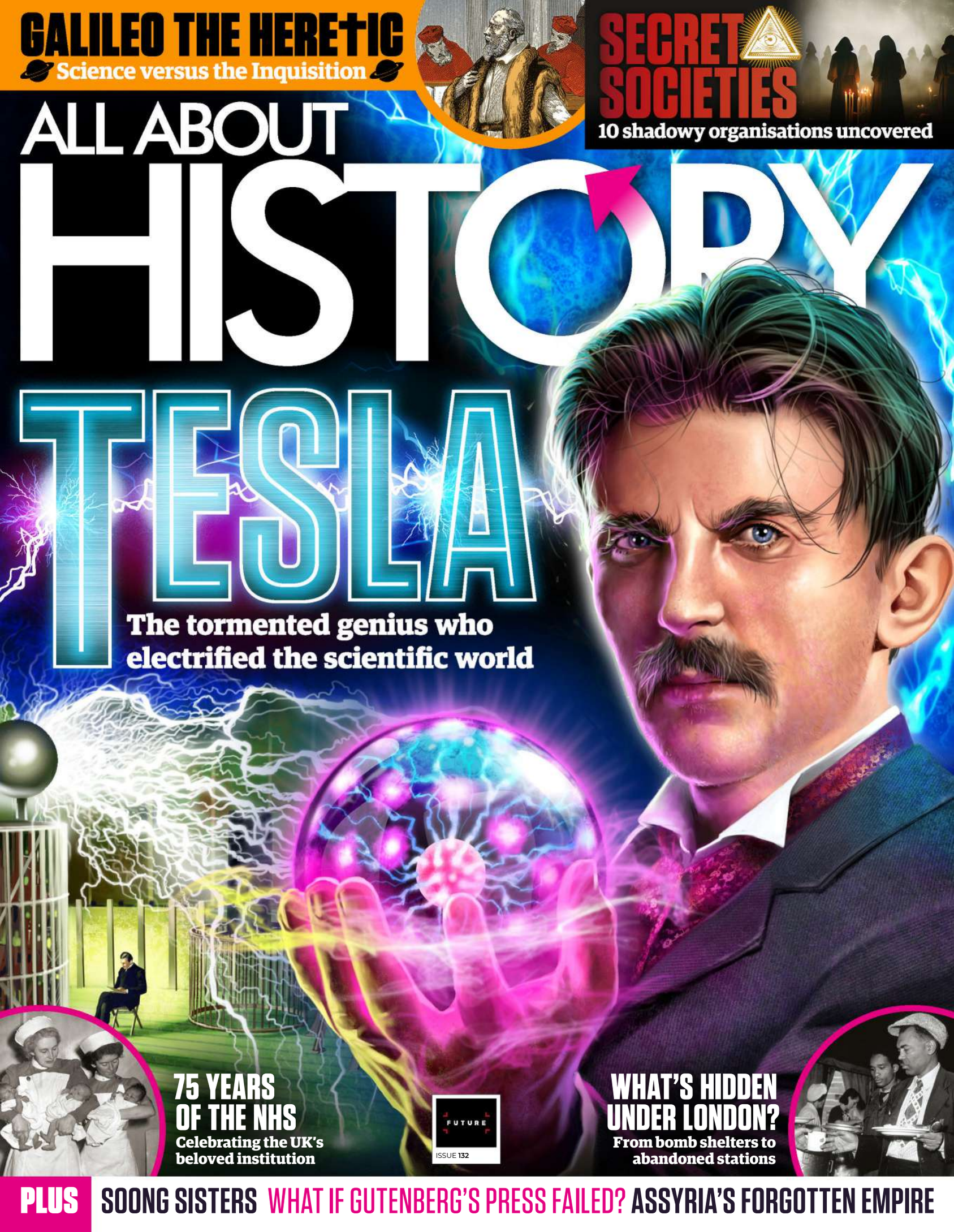
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Tesla examining machine parts in front of sketches of some of his inventions

Welcome

Tesla is a compelling combination of classic archetypal character traits that make him an endlessly fascinating figure. For starters, we have the maverick. A scientific genius who broke boundaries with his discoveries and wowed audiences with his inventions that seemed to border on the magical. Then, there's the underdog. A great inventor who stood up to a corporate enterprise. Finally, the reclusive genius. A great mind, locking themselves away in an isolated locale to work and invent, undisturbed. No wonder his story has attracted so many curious minds over the decades and made Tesla a popular figure in fiction.

These are all simplifications of the real man behind the mythos, but the romanticism of this framing is undeniable. Still, we wanted to get to the heart of Nikola Tesla to learn more about who he really was. Our features editor Callum McKelvie takes us on that journey with the aid of Tesla experts W Bernard Carlson and Marc Seifer. This issue you can also discover the massively influential Soong sisters, see how Galileo went head to head with the Inquisition, and uncover the history of secret societies. Not to mention taking a peek at what lies beneath London and rediscovering the great Assyrian Empire. Lots for you to start investigating, so I hope you enjoy the issue, as always.

Jonathan Gordon
Editor

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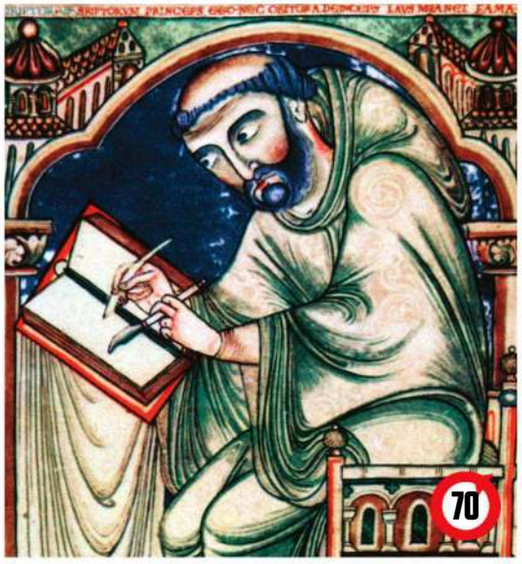

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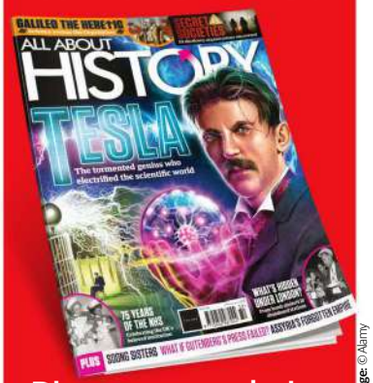

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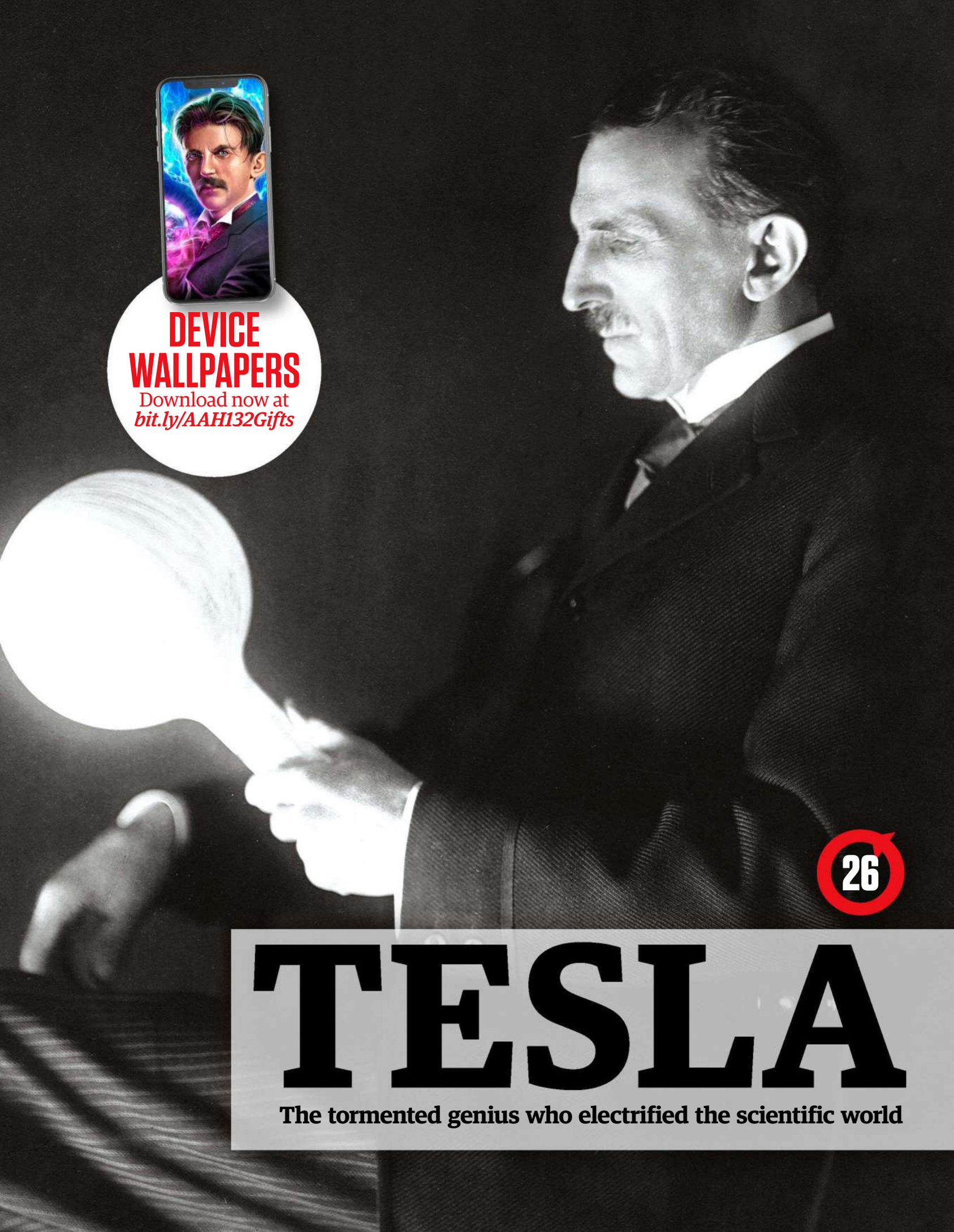

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TESLA

The tormented genius who electrified the scientific world

Defining Moments

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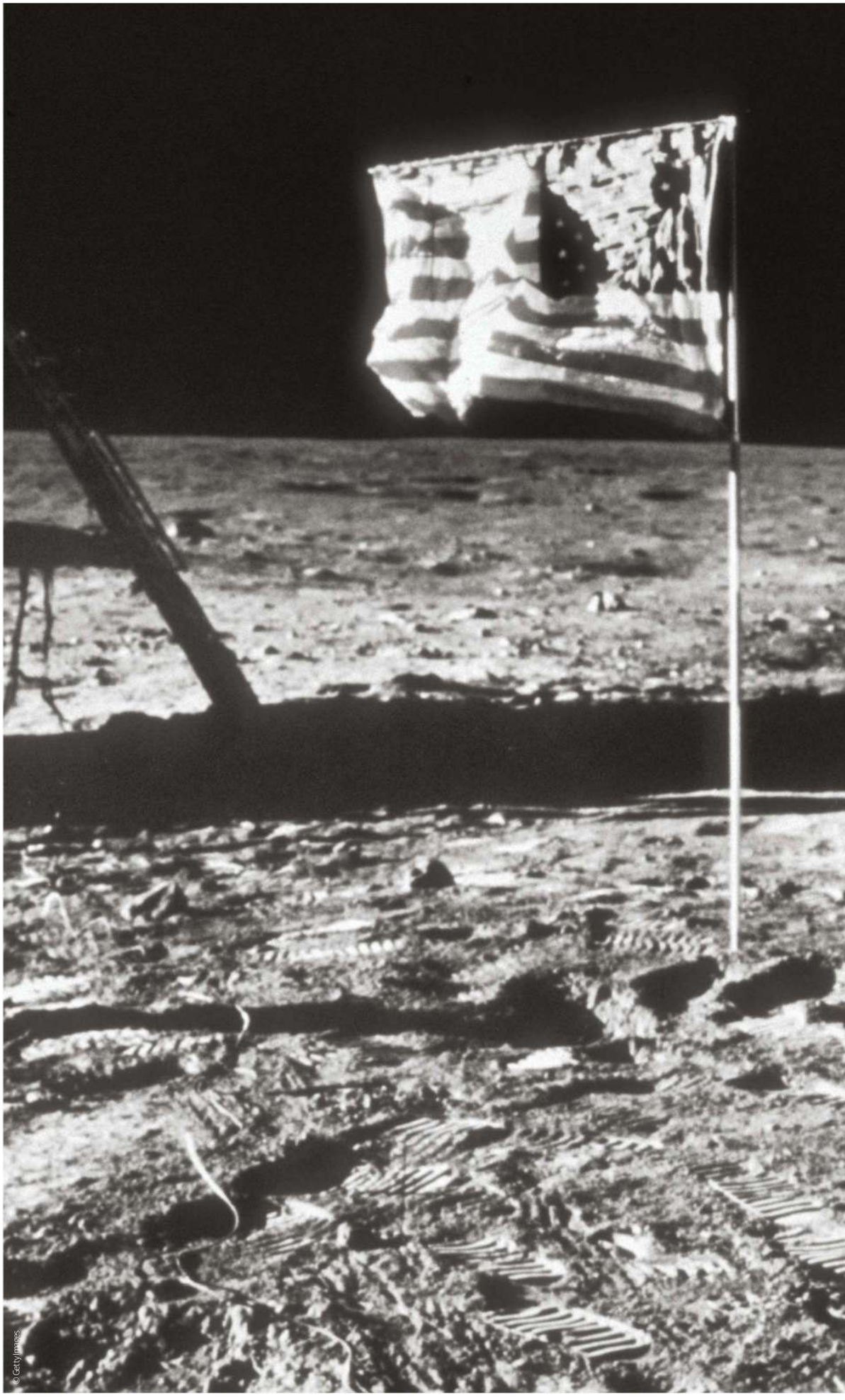
22 July 2013

PRINCE GEORGE IS BORN

The first child of William, Prince of Wales, the heir to the British throne, and Catherine, Princess of Wales, George Alexander Louis was born at 4:24pm on 22 July 2013 at St Mary's Hospital in London. Upon his birth, the newborn Prince George became third in line to the throne. Since the death of his great grandmother, Queen Elizabeth II, in 2022, he has become second in line.



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20 July 1969

MAN WALKS ON THE MOON

After launching into space from Kennedy Space Center four days earlier, American astronauts Neil Armstrong and Buzz Aldrin became the first people to land on the moon. At 10:56pm on 20 July 1969, Armstrong descended from the lunar module and climbed down the stairs to the moon's surface saying: "That's one small step for a man, one giant leap for mankind." His first steps on the moon were witnessed on TV by more than half a billion people. This photograph of Aldrin was taken by Armstrong.

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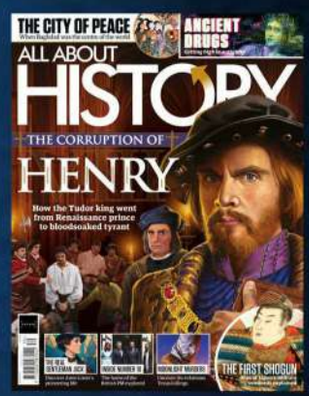

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ALL ABOUT THE STUARTS

From civil wars to assassination plots and the Great Fire to the Glorious Revolution, discover Britain's most turbulent era

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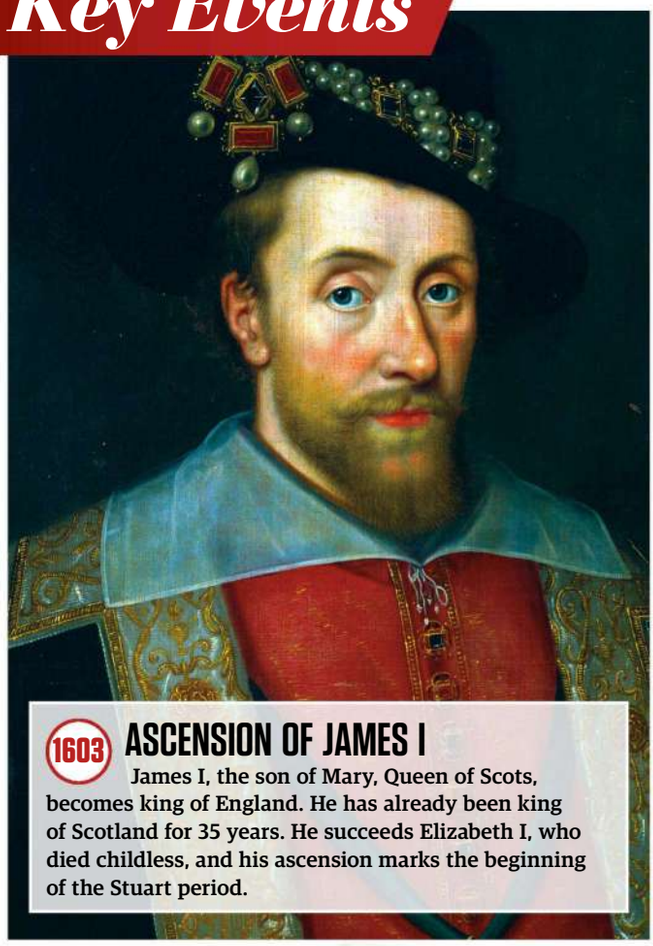
Main image: © Getty Images

Written by Callum McKelvie, Emily Staniforth, Jackson van Uden

Key Events



1603 ASCENSION OF JAMES I

James I, the son of Mary, Queen of Scots, becomes king of England. He has already been king of Scotland for 35 years. He succeeds Elizabeth I, who died childless, and his ascension marks the beginning of the Stuart period.

Although Fawkes has become the most well known, the plot was actually led by Robert Catesby.

1605 THE GUNPOWDER PLOT

Guy Fawkes and his fellow conspirators attempt to assassinate James I by blowing up Parliament. The intention is to try and establish a Catholic monarchy in England. However, the plan comes to nothing when the conspirators are caught before it can be carried out.

JAMES I *DAEMONOLOGIE* PUBLISHED IN ENGLAND 1603

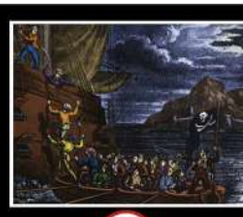
King James' treatise on witchcraft is released in England. The book had first been published in Scotland in 1593 and is said to have been an inspiration for Shakespeare's *Macbeth*.

MATTHEW HOPKINS 1644

Lawyer Matthew Hopkins, 23, begins his 'career' as witchfinder general with a case in which 24 women are accused of witchcraft. Four die in prison and 19 are executed.

THE GOLDEN AGE OF PIRACY BEGINS 1650

Beginning in 1650 and lasting until 1730, thousands of pirates target merchant vessels and port towns at an unprecedented level. Colonial powers struggle to deal with the criminal scourge.



1603 — 1605 — 1642 — 1660

DEATH OF WILLIAM SHAKESPEARE 1616

The renowned playwright, whose many plays and poems earned him fame and fortune, dies in his hometown of Stratford-upon-Avon.

INTERREGNUM 1649

For 11 years England is a republic, led by Oliver Cromwell. The nation becomes increasingly puritan with holidays such as Christmas banned, along with popular pastimes such as theatre.

THE FIRST ANGLO-DUTCH WAR 1652

British and Dutch trade interests continue to clash, resulting in the two nations declaring war in 1652. This is the first of a series of wars that last until 1784.

1642 ENGLISH CIVIL WARS

One of the most turbulent periods in British history occurs when King Charles I goes to war against Parliamentarian forces after disputes over how the country should be governed. The war ends in 1651 in victory for the Parliamentarians.

1660 ENGLISH MONARCHY RESTORED

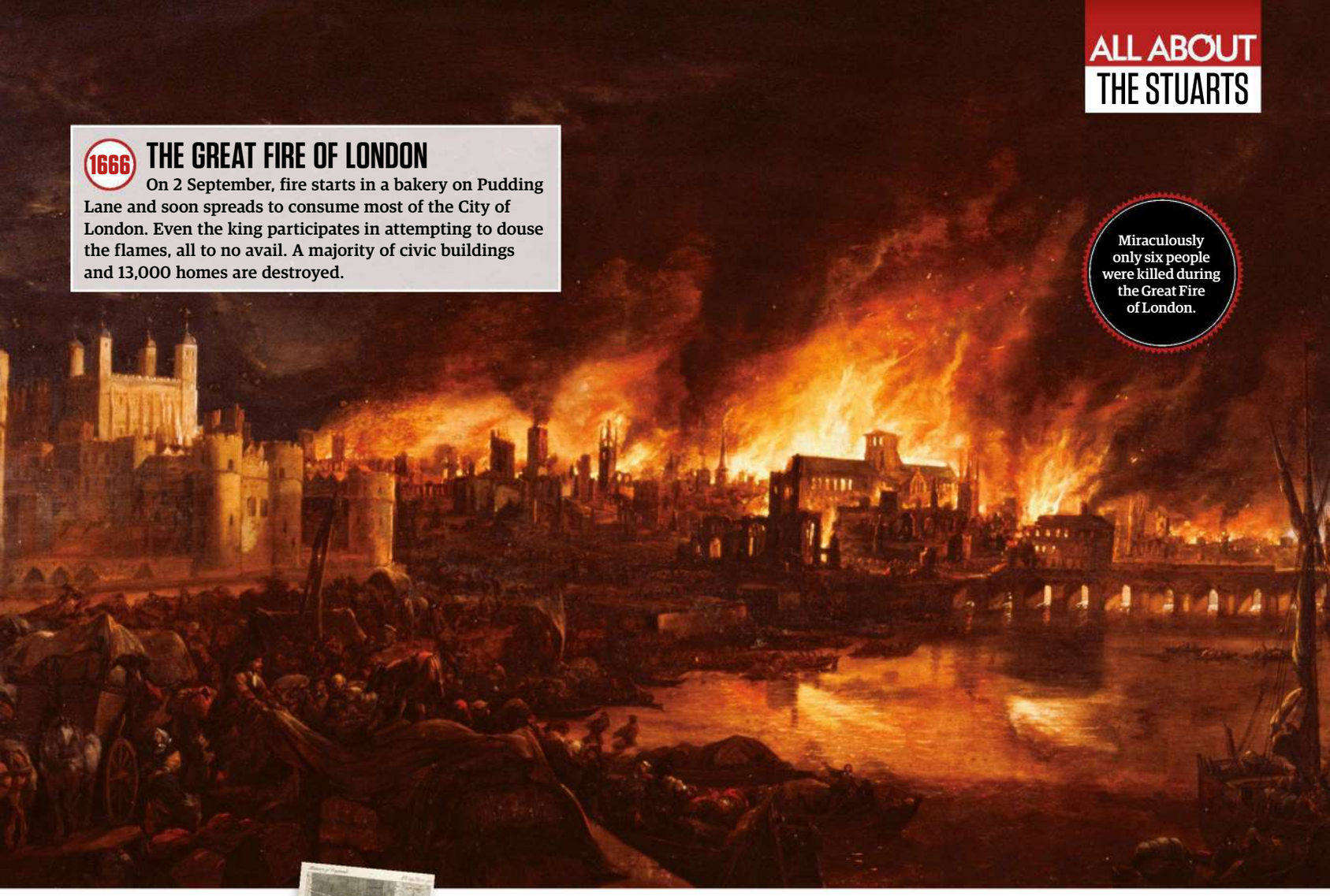
After Cromwell's son proves to be a disastrous successor, Charles II is invited back to England to take over the throne. He orders that Cromwell's body be disinterred, decapitated and the head displayed outside Westminster.

All images: ©Alamy, © Getty Images

1666 THE GREAT FIRE OF LONDON

On 2 September, fire starts in a bakery on Pudding Lane and soon spreads to consume most of the City of London. Even the king participates in attempting to douse the flames, all to no avail. A majority of civic buildings and 13,000 homes are destroyed.

Miraculously only six people were killed during the Great Fire of London.



THE GREAT PLAGUE 1665

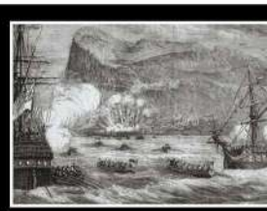
London is hit by the deadly bubonic plague. Nearly 14% of the population of the city is lost and Charles II and his courtiers flee to Hampton Court.

MONMOUTH REBELLION 1685

James Scott, Duke of Monmouth, attempts to take the crown from James II. His army is defeated at the Battle of Sedgemoor and Monmouth is executed shortly afterwards.

WAR OF THE SPANISH SUCCESSION 1701

Following the death of Charles II of Spain, the Spanish Empire is thrown into conflict between potential heirs Philip of Anjou and Charles of Austria. Britain supports Charles, hoping to further its own objectives.



1666 — 1688 — 1702

BIRTH OF BLACKBEARD c.1680

Edward Teach is born. He earns notoriety as one of the most feared and ruthless pirates, better known as Blackbeard. He is hunted down and executed in 1718.

THE BATTLE OF THE BOYNE 1690

James II attempts to retake the throne through an alliance with Ireland and France. A decisive battle on the Boyne River ends with James once again fleeing to France.

ACT OF UNION 1707

The Act of Union treaty joins England and Scotland under the name of Great Britain. Since 1603 the monarch of England had ruled both nations.

1688 THE GLORIOUS REVOLUTION

The ascension of James II to the throne is followed by a period of turmoil with an attempted rebellion and tension between the Catholic king and a Protestant public. William of Orange lands with his army and James flees.

1702 QUEEN ANNE ASCENDS TO THE THRONE

In March, Queen Anne ascends to the throne. Under her rule the Treaty of the Union comes into effect. The last monarch of the Stuart period, her death in 1714 sees the start of the Georgian era.

Queen Anne is known to have suffered from severe gout.

ST PAUL'S CATHEDRAL

London, UK
1675 - present

A church has stood on the site of St Paul's Cathedral in London since 604 CE. The original building is now completely lost, with very little historical record left to help historians and archaeologists determine what the first religious structure would have looked like. However, it is known that the initial wooden structure at the consecrated site was destroyed by the Vikings in 962 CE, while subsequent incarnations of St Paul's burned to the ground, in around 1087 and during the Great Fire of London in 1666. After the cathedral's encounter with this devastating fire, King Charles II appointed the architect Christopher Wren to design and rebuild St Paul's for what would be the final time.

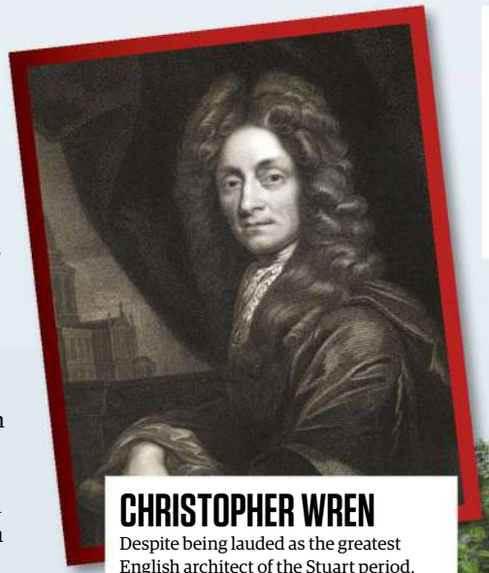
Wren already had a connection with the cathedral as he had been advising on how best to conserve and repair the ageing building, in an unofficial capacity, since 1661. The new building, designed by Wren, began to come to life in 1675 and took 35 years to be completed. The result was an architectural masterpiece in the English Baroque style that came to be popular during the Stuart era. While the earlier buildings on the site suffered irreparable damage through the ages, Wren's St Paul's has truly stood the test of time enduring an attempted bombing by the Suffragettes in 1913 and miraculously surviving the Blitz of 1940. The cathedral has since served as the site of significant events of commemoration and celebration, including the royal wedding of Charles, Prince of Wales (now Charles III) and his first wife Lady Diana Spencer, as well as the state funerals of historic figures such as Horatio Nelson, the Duke of Wellington and Winston Churchill. St Paul's Cathedral remains one of London's most iconic landmarks known for its magnificent dome that towers over the city.

INTERIOR DECORATION

St Paul's is home to many beautiful and important pieces of art that decorate the interior of the building. Among these are the eight scenes of the life of St Paul, painted by artist Sir James Thornhill from 1716 to 1719, which adorn the interior of the church's dome. Other famous works of art at St Paul's include *The Light Of The World* by William Holman Hunt and *Mother And Child: Hood*, a contemporary sculpture by Henry Moore.

OTHER GALLERIES

In addition to the Whispering Gallery, two further galleries are situated further up St Paul's dome. Both these galleries encircle the exterior of the famous dome and allow visitors to experience Wren's architecture at close quarters. The Stone Gallery stands at over 53 metres from ground level while the higher and smaller Golden Gallery sits at over 85 metres from the floor. The Golden Gallery is the perfect place to experience the cathedral's impressive views of London.



CHRISTOPHER WREN

Despite being lauded as the greatest English architect of the Stuart period, Christopher Wren began his career as a scientist and astronomer, teaching science subjects at Oxford University before he turned his hand to architecture in his thirties. Having only started studying architecture in 1662, he was officially appointed by Charles II to build St Paul's in 1673. Wren's illustrious architectural career saw him help rebuild over 50 churches after the Great Fire of London as well as other buildings of note like Greenwich Hospital.

WHISPERING GALLERY

One of the cathedral's greatest attractions is the Whispering Gallery. The gallery encircles the interior of the iconic dome along with two other accessible galleries. It is famed for its acoustics, with people able to hear each other making the quietest noises from a great distance due to sound waves bouncing off the curved interior of the perfect dome that sits atop the building.

BURIALS

Before the current St Paul's Cathedral was built, many people of historical importance were buried in the older incarnations of the church including King Ethelred the Unready, John of Gaunt and Sir Francis Walsingham. In the current St Paul's, famous figures like the Duke of Wellington, Horatio Nelson and JMW Turner have found their final resting place. Christopher Wren himself is buried in the crypt of St Paul's.

Inset images: © Alamy, © Getty Images, © Shutterstock
Illustration by Adrian Mann

DOME

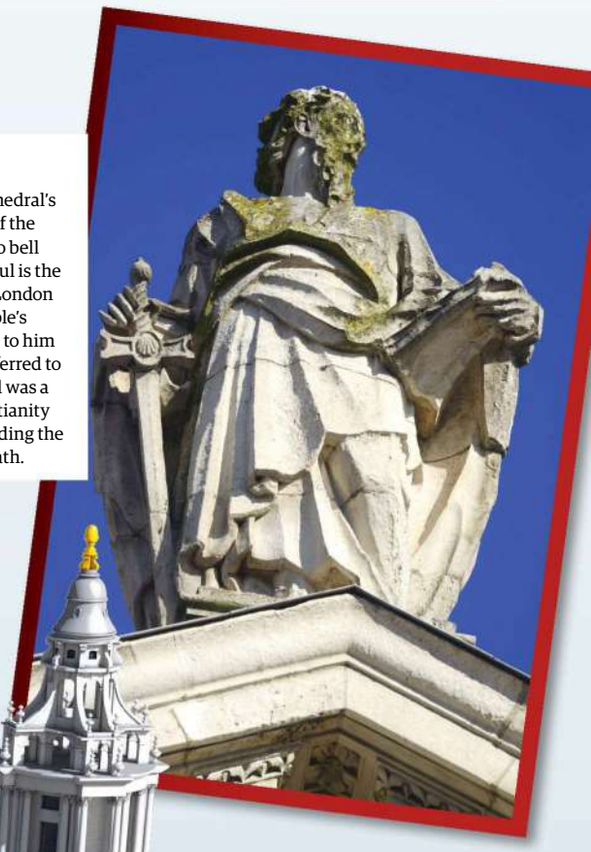
Arguably the most recognisable and famous architectural feature of St Paul's Cathedral is the imposing dome that sits at the centre of the building. Wren's design for the dome was influenced by Michelangelo's dome at St Peter's in Rome and Hardouin-Mansart's dome at the Invalides church in Paris. The dome at St Paul's is made from three structures: the outer dome, a brick dome which provides structural support, and the inner dome.

BELLS

Two bell towers house the bells of St Paul's. The oldest of these is the Service Bell that was made by London bellfounder Philip Whiteman in 1700 and hung in the tower shortly after. The largest bell at St Paul's, and the largest bell in the UK still used, is Great Paul which weighs 16.75 tons. While Great Paul is only rung on special occasions, three clock bells, including Great Tom, toll on the hours and quarters.

ST PAUL

A statue of St Paul, the cathedral's namesake, stands on top of the pediment between the two bell towers of the church. St Paul is the patron saint of the city of London and has 13 books of the Bible's New Testament attributed to him and his disciples. Often referred to as Paul the Apostle, St Paul was a major figure in early Christianity who is credited with spreading the word of Christ after his death.



CORINTHIAN PILLARS

The pillars at the entrance to St Paul's are classed as Corinthian in style. Corinthian pillars were used widely in the architecture of the ancient Greeks and their revival was seen in many Renaissance and Baroque buildings, in England and across Europe. Corinthian pillars are a recurring feature throughout St Paul's both in the exterior and interior of the church.

MONUMENTS AND STATUES

There are over 500 different monuments at St Paul's Cathedral, both included as part of Wren's design and used in decoration and commemoration within the building itself. The statues within the cathedral were only added around 100 years after Wren's structure was completed, as his original design left the interior devoid of monuments. Outside St Paul's stands a statue of Queen Anne, who was monarch at the time of the cathedral's completion, by sculptor Francis Bird.

Anatomy

ROUNDHEAD CAVALRYMAN

England 1642-1651

HELMET

The most recognised aspect of a Roundhead's armour is undoubtedly the 'lobster pot helmet'. With metal bars at the front of the helmet, the soldier's face was largely protected while the metal 'tail' at the back shielded a soldier's neck. Contrary to popular belief, cavalrymen on both sides of the conflict wore helmets like this.

FIELD SIGNS

As it was difficult to distinguish the opposing sides from each other during fighting, soldiers would wear field signs in their helmets, such as pieces of paper or leaves, to identify themselves to those on their own side. Some soldiers even had field words they could shout out during the battle.

SASHES

To distinguish between factions and regiments, soldiers during the civil war sometimes had sashes to wear over their coats. Parliamentarians took to wearing sashes of a "tawny orange" colour, or sometimes pale blue, while the Royalists adopted a crimson sash for their attire. However, these sashes were not always easy to see through the gun smoke of the battlefield.

GAUNTLET

Cavalrymen wore a steel gauntlet over one of their hands to provide protection when they were fighting on horseback. While holding the reins a cavalryman's hand, often the left one, was exposed to damage from swords. The opposite hand remained free to allow the soldier to fire his pistols with ease.

WEAPONS

Cavalrymen would always carry a pair of pistols, in the holsters of their horse's saddle, and a broadsword. The sword was the main weapon they used in battle. It was also expected that the cavalry would carry a musket called a 'carbine', but this was not always possible.

ROUNDHEADS VS CAVALIERS

The concept that Parliamentarian 'Roundhead' soldiers wore rounded helmets and Royalist 'Cavalier' soldiers dressed in large floppy and feathered hats is a myth popularised by the Victorians. In reality, soldiers on both sides of the civil war dressed in largely the same attire for battle – a helmet, breast and back plate, and thick buff coat.

THE CAVALRY

The cavalry on both sides of the war would fight on horseback. The troops were split into regiments and ideally would be heavily armoured to protect themselves and to look imposing to their opposition. The cavalry were different to dragoon troops, who would ride horses into the battle but then dismount to fight.

Illustration by Kevin McGivern

Historical Treasures

COFFEE POT

During the reign of the Stuarts, coffee became a popular beverage of high society Britain, 1702

In Cambridge in 1650, a strange new enterprise began – the coffee house. Coffee houses were a particularly popular development during the reign of the Stuarts. Serving male-only clientele, they also forbade alcohol and soon became places for the societal elite to meet and discuss ideas. In these smokey houses, with the smell of roasting coffee in the air they would debate the latest theories in politics, philosophy, literature, art, theology and the developing sciences. These establishments were also popular with traders and businessmen who would meet to make deals and discuss business propositions.

Two years after the opening of the Cambridge house, London followed suit. This establishment was run by Pasqua Rosée, a servant or valet to Daniel Edwards. The latter was particularly important when it came to importing coffee from Turkey and (according to Layers of London) it is suspected that the shop was opened to satisfy the overwhelming number of visitors who came to his house in search of the beverage. Such was the popularity of Pasqua Rosée's establishment that by 1663 there were some 83 coffee houses in the city of London and by 1675, according to The History of London, there were 3,000 across the country.

Due to its origins, it is likely that the coffee of the time owed more to traditional Turkish coffee than the beverage as we understand it today. While it seemed the taste left something to be desired, the caffeine content appealed. Unlike taverns, the sobriety offered by coffee doubtless led to more stimulating conversations. However, there was concern that the houses were actually a hotbed of conspiracy, with plotters meeting to distribute pamphlets and discuss how to overthrow Charles II. Plans were put in place to close the establishments down, but such was their popularity that the scheme was abandoned.

Presented here is a coffee pot, from the early 18th century. The coffee would have been served in one of these pots, then poured into smaller cups for drinking. The majority of pots at this time were metal, akin to the example shown here, though porcelain models were later developed.

JOHN CHARTIER

This particular example was crafted by John Chartier. An incredibly important silversmith of the 18th century, Chartier was the son of a French refugee who had fled from the attacks on the Huguenots. Examples of his works from silverware to 'snuffers' (devices intended to cut off the burned wicks of candles) can be found in museums all over the world.

SPOUT

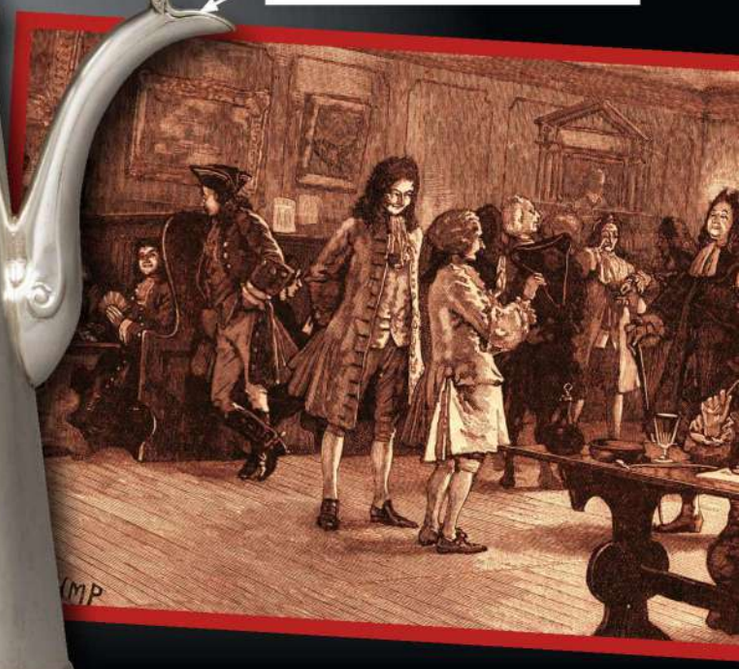
The placement and shape of the spout was to prevent the coffee grounds from being poured into the drinker's cup, as filters were not used. Some models also had flaps covering the mouth of the spout.

HANDLE

At the back of the pot is a wooden handle. This is not visible as according to the Victoria & Albert Museum and unlike more contemporary pots, the handles would often be placed at right angles to the spout.

A CYLINDRICAL DESIGN

17th century coffee pots were usually of a tapering cylindrical design with a domed top. Early models also had flat bases, but those made after 1730 were supported by three feet and developed into a rounder, pear shape. In the centre of the body of this model is a vacant cartouche, suggesting that this may have been owned by an upper-class gentleman.



ABOVE
A coffee house as depicted during the reign of Queen Anne

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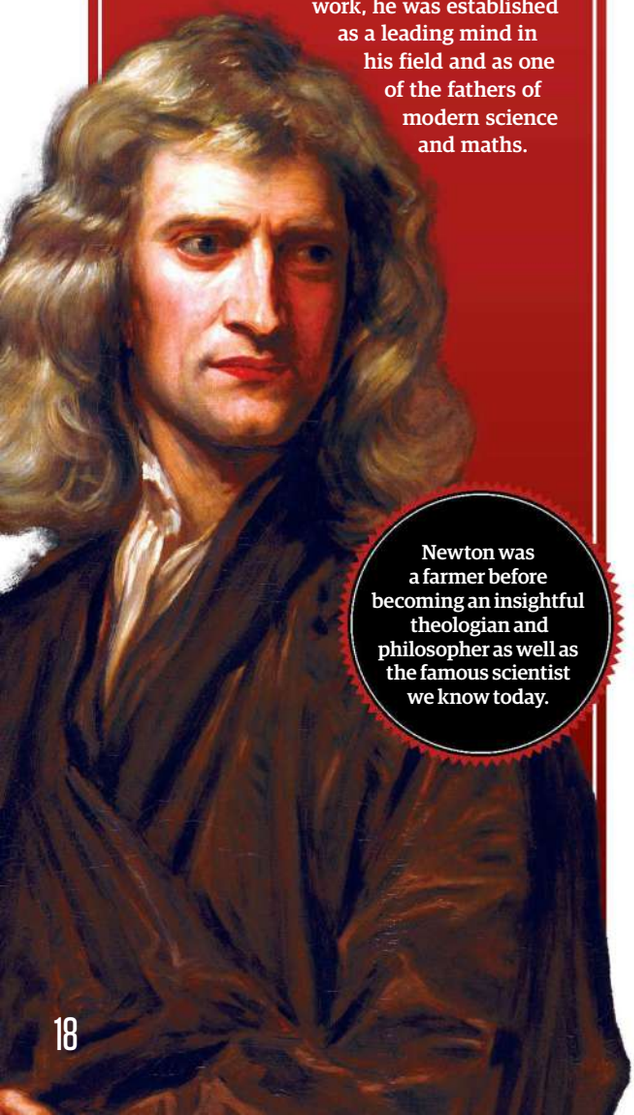
GREAT MINDS OF THE STUART ERA

Too often ignored in favour of their Tudor cousins, the Stuarts are the real forefathers of the modern world!

Isaac Newton
4 January 1643 – 31 March 1727

There are similarities between the beginning of Isaac Newton's creativity and creativity today, as Newton was able to thrive in the closures of the plague epidemic to work on his ideas in the heart of Lincolnshire. During the Stuart period Newton developed his principle of 'Universal Gravity' and theories of gravitation and diffraction, which after being published in his book *Principia* would shape the maths and science worlds. After European scientists failed to discredit his work, he was established as a leading mind in his field and as one of the fathers of modern science and maths.



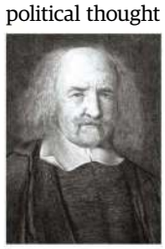
Newton was a farmer before becoming an insightful theologian and philosopher as well as the famous scientist we know today.

APHRA BEHN
1640 – 16 APRIL 1689

A genius with an obscure past makes Aphra Behn an interesting character. A royalist spy during the interregnum turned playwright and poet, Behn explored the role sexuality, gender and ethnicity played in politics and life, giving her a reputation as a literary figure. Her work demonstrated the power that women, and women of colour, possessed. She also strengthened the legitimacy of Charles II, an achievement that also demonstrated her literary skill.

THOMAS HOBBES
5 APRIL 1588 – 4 DECEMBER 1679

Political philosopher Thomas Hobbes' work on morality and the social contract, inspired by the chaos of the English Civil War and the interregnum, continues to influence the world's political thought today. As a royalist, Hobbes spent large amounts of time in France in exile where he worked with Rene Descartes, becoming one of the most famous English intellectuals abroad, enhancing England's position and influence as an intellectual power.



JOHN MILTON
9 DECEMBER 1608 – 8 NOVEMBER 1674

One of the greatest epic poets in English literary history, known for *Paradise Lost*, John Milton was also a prominent voice against tyranny, and for religious tolerance. His work influenced the American and French Revolutions. This staunchly held opposition to tyranny led him to Republicanism as he supported and later worked in Cromwell's government. His work and voice continue to be relevant today as it is frequently cited in arguments against modern governmental tyranny.

Margaret Cavendish
(Duchess of Newcastle-upon-Tyne)
1623 – 1673

After gaining her independence in 1643 by joining the court of Queen Henrietta Maria, Cavendish had an opportunity to try and better her position, and this opportunity came when she married William Cavendish. Through William, Cavendish was introduced to some of the leading minds of Stuart England and Europe and engaged in intellectual discussions, even speaking in front of the Royal Society later in her life. Through her husband, Cavendish was able to fund the publishing of her philosophical and poetry work in her own name, advancing her 'atomic theories' and ideas on the societal position of women.

William Shakespeare
April 1564 – 23 April 1616

Shakespeare, who was a favourite of Elizabeth I, was instantly catapulted to the centre of the English Renaissance with the accession of James I after he sponsored Shakespeare's company. Shakespeare was able to utilise his intellectual capacity and talent to adapt his message and verse to fit this new style of monarchy and James' own interests. The themes of theology, power and justice were explored in a new way that cemented Shakespeare as a great mind of Jacobean England. *King Lear* encapsulates this flexibility with a combination of his own and James' perspectives.

The man who entertained many is often himself romanticised to such an extent that it is claimed he was born and died on the same day.

ELIZABETH CARY
(VISCOUNTESS FALKLAND)
1585 – 1639

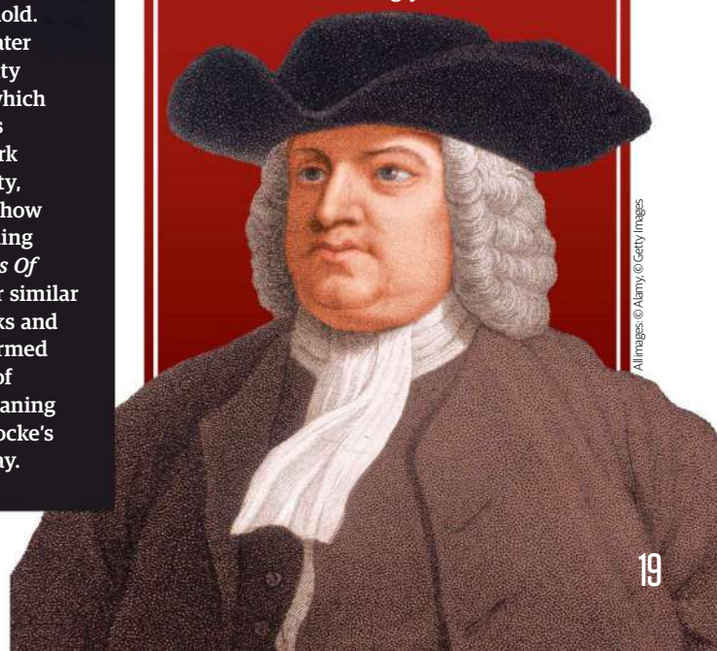
Elizabeth Cary was a trailblazing playwright, as she was the first woman in England to pen a full-length play despite opposition from her family. Her play *Mariam* advocated women's rights and equitable divorce laws, unheard of themes for discussion in the period. A leading mind of Stuart England, her forward-thinking nature and independent thought ran contrary to the established thinking of the time.

John Locke
29 August 1632 – 28 October 1704

Originally a physician, John Locke in his earlier professional career worked at the University of Oxford and later became a member of Lord Ashley's household. Under Lord Ashley, Locke would later come into positions of responsibility within the government, through which he would come to work on policies surrounding the colonies. This work led to him thinking about humanity, how a country should be run, and how a government should operate, leading to him producing his *Two Treatises Of Government* and other similar works. These works and Locke's ideas formed the backbone of liberalism, meaning we still feel Locke's influence today.

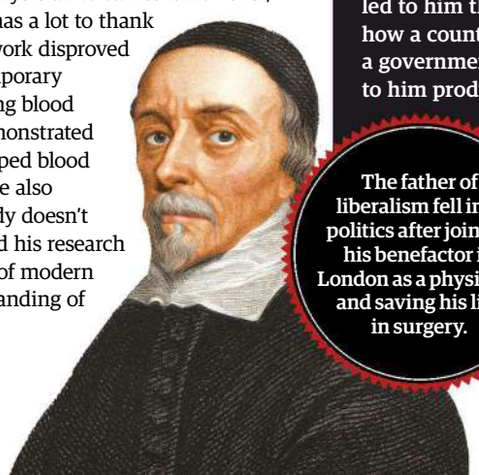
William Penn
14 October 1644 – 30 July 1718

William Penn was an influential Quaker figure in Stuart England as he worked for religious tolerance and freedoms. Going against the establishment and being a Quaker often landed him in trouble, but for a time he enjoyed a friendship with Charles II and later James II, which led to him being granted a charter to set up a colony, Pennsylvania, in America. Here he really established himself as a true great Stuart mind as he set up a free, tolerant, and accountable government within his colony that was in stark contrast to Charles II's increasingly dictatorial rule.



WILLIAM HARVEY
1 APRIL 1578 – 3 JUNE 1657

William Harvey was a physician who trained in Italy before returning to England and eventually becoming a royal physician to James I. However, modern medicine has a lot to thank Harvey for, as his work disproved Galen's and contemporary theories surrounding blood circulation and demonstrated that the heart pumped blood around the body. He also proved that the body doesn't consume blood, and his research forms the bedrock of modern medicine's understanding of the heart.



The father of liberalism fell into politics after joining his benefactor in London as a physician and saving his life in surgery.

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Q&A

BRITAIN IN TURMOIL

Dr Clare Jackson discusses why Britain was viewed as a 'failed state' during the Stuart period of instability

Why was Stuart England seen as a 'failed state' by its European counterparts?

One argument that attracted particular attention in my recent book, *Devil-Land: England Under Siege 1588-1688*, was the claim that "to contemporaries and foreigners alike, 17th century England was a failed state: a discomfiting byword for seditious rebellion, religious extremism and regime change." It was part of the book's emphasis on Stuart England's characteristic insecurity, instability and vulnerability, which is also reflected in its title. The nickname 'Duyvel-Landt', or 'Devil-Land' was applied to mid-17th century England by an anonymous Dutch pamphleteer in 1652, who had been outraged by the English Parliament's decision to put on trial and publicly execute its divinely ordained king, Charles I, while the successor republican regime seemed to declare war on the Dutch Republic as commercial rivals.

Dr Clare Jackson is the senior tutor at Trinity Hall, University of Cambridge. Her research focuses on 17th century Britain and she has written extensively and presented television shows about the Stuarts.

In this context, it was a deliberately polemical and provocative claim, and anachronistic or insensitive parallels with current affairs are unhelpful. Today, there are clear metrics and data-based policy tools deployed to measure 'failed states'. But, in 1652, when that Dutch pamphleteer described England as 'Devil-Land', the country had been bitterly divided by civil war for over a decade; brothers had taken up arms against one another for either King or Parliament; countless wartime atrocities had occurred, including premeditated massacres; and, in Ireland, extensive ethnic cleansing had occurred. After Charles I's regicide in January 1649, England underwent no less than five major regime changes in a decade with more minor revolutions and constitutional experiments before Charles II was restored in 1660.

Photo courtesy of: Alister McCormick

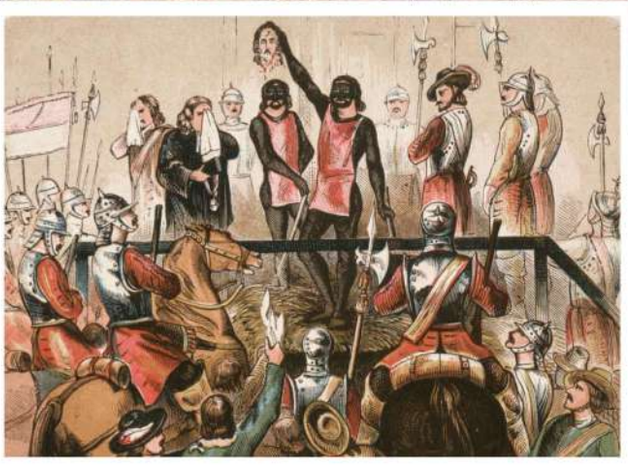
LEFT
James VI of Scotland and I of England fostered relations with many European nations

What was England's relationship with the rest of Europe like during this period?

Unpredictable. England was a medium-sized state, with a young Protestant church and considerably fewer financial and military resources than the main late-16th century superpower, Philip II's Spain, or during the later 17th century, Louis XIV's France. England's Stuart rulers had no large standing army ready to repel invaders and its coastal defences instead relied on local militias and musters, and accurate intelligence. Driving Protestant anxieties was a constant fear among contemporaries of an international popish conspiracy and England's vulnerability to hostile influence and potential Catholic encirclement. Contemporaries were right to be worried: between 1590 and 1690, Counter-Reformation military successes and missionary zeal combined to reduce Protestantism's geographical extent from one-half to one-fifth of Continental Europe's land area. Hence to opportunistic foreign eyes, Stuart England remained one of only a reduced handful of countries still inhabited by obstinate heretics.

To what extent did the personalities of the various Stuart monarchs have an effect on the way England was perceived by Europe?

The different personalities, diplomatic agendas and political associations of England's Stuart rulers did influence how the country was perceived overseas. Compared to their Tudor predecessors, the Stuarts were a notably cosmopolitan dynasty. James VI & I was married to Queen Anne of Denmark who wrote fluently in seven languages: Danish, German, Latin, French, Scots, English and Italian. Each Stuart monarch also had a consort with confessional Catholic ties and foreign dynastic links and the



successive queens consort of England's Stuart kings brought separate networks of political patronage, confessional attachments and foreign entanglements.

In terms of foreign policy, when James VI succeeded Elizabeth I in 1603, he had already ruled Scotland as an adult king for almost two decades and had developed extensive diplomatic relations with states including France, Spain, the Dutch Republic, the Spanish Netherlands, Denmark-Norway and the papacy. As king of England, James received over 250 diplomatic delegations from over 30 states between 1603 and 1625.

What, in your opinion, was the biggest crisis faced by England during the reigns of the Stuarts?

The civil wars of the 1640s, the geopolitical complexity of which arose as a result of England becoming part of a Stuart multiple monarchy encompassing England, Scotland and Ireland in 1603. While the kingdoms of England, Scotland and Ireland remained separate and independent, they were also riven by religious difference. Although a Protestant, Episcopalian church was established as the state church in all three kingdoms, the majority population in Ireland remained Catholic, while in Scotland, opposition to church government by bishops and archbishops prompted the eventual re-establishment of Presbyterianism in 1690.

Hence when Charles I's authority started crumbling in Scotland in the late-1630s, a 'billiard ball' effect saw civil war eventually break out in all three kingdoms with devastating effects. In mainland Britain and Ireland, a greater proportion of the population died as a result of the mid-17th century civil wars than in both the two 20th-century World Wars combined. Charles I's execution was followed by the only 11 years in the country's history in which England has been a republic. Although the period 1649-60 is often referred to as 'the Interregnum', this can sound misleadingly reassuring: as though the 1650s were a curious aberration before kingship was restored. But the lived experience for contemporaries would have been anxious and uncertain.

How would you characterise the legacy of the Stuarts in England and the rest of Europe?

The events that took place under England's Stuart rulers were so climacteric that they permanently altered our country's destiny and fundamentally explain current constitutional arrangements within the British Isles, as well as the nature of England's historical relations with its Continental neighbours. A key legacy of the Williamite Revolution was that the English Parliament has met every year since 1689 and was no longer an occasional 'event' but a regular 'institution'. Within a couple of decades, the unintended consequences of inviting William of Orange to become king of England in 1689 were a massive expansion of the country's fiscal resources, military capacity, civil service and overseas empire to render England an 18th-century superpower, with a reputation rivalling that of Philip II's Spain or Louis XIV's France.

TOP
William III at the Battle of the Boyne in 1690, taking on the forces of James II

ABOVE
The execution of Charles I in 1649 sent shockwaves across Europe

DEVIL-LAND: ENGLAND UNDER SIEGE 1588-1688 (ALLEN LANE, 2021) BY CLARE JACKSON, WINNER OF THE WOLFSON HISTORY PRIZE 2022, IS AVAILABLE TO BUY NOW.

All images: © Getty Images

STUART HOUSES AND ARCHITECTURE

Discover the centuries of fascinating history behind these beautiful Stuart buildings

1 BANQUETING HOUSE
LONDON

A masterwork by the noted architect Inigo Jones, the Banqueting Hall was designed to be a place where King James could impress his guests and host extravagant parties. According to Historic Royal Palaces, the Banqueting House was originally even more extravagant and colourful than it is now. Purportedly the exterior was built out of alternating honey-coloured and luscious pink stone. Unfortunately, in 1774 a process of resurfacing it with grey Portland stone would begin.

However, the most famous part of the Banqueting House is inside. Installed on the ceiling of the main hall are nine paintings by the artist Peter Paul Rubens. According to University College London, the most renowned are three central canvases depicting the *Union Of The Crowns*, *The Apotheosis Of James I* and *The Peaceful Reign Of James I*. These works were completed in 1636.

The Banqueting Hall is the only structure of the famous Palace of Whitehall that still stands. In 1698, the palace was destroyed when a Dutch maidservant left sheets drying on a charcoal brazier unattended.

The Banqueting House is only open to the public on specific dates. Please check the website before travelling.

Banqueting House in London, all that remains of the Palace of Whitehall

© Getty Images

2 ST PAUL'S CATHEDRAL
LONDON

St Paul's Cathedral has long been one of London's most identifiable landmarks

St Paul's Cathedral is one of the most recognisable landmarks in London. The masterpiece of renowned architect Sir Christopher Wren, construction took some 35 years. The area had been the site of a Christian church since 604 CE and a fourth cathedral had been constructed during the 11th century. This building fell in and out of disrepair until it was finally destroyed during the Great Fire of London.

Wren's original designs were deemed too expensive and too elaborate and it was only in 1675 that he hit upon a design that was approved. Even then, this would undergo massive alterations with the impressive tower planned being swapped for the now iconic dome. Artist Sir James Thornhill was awarded the responsibility of decorating the interior of the domes. Due to the breadth and height of the area needing to be decorated, this was no easy task and according to Dr Richard Johns, of the University of York, would be the most expensive decorative scheme in England at the time.

During World War II, St Paul's Cathedral was considered extremely vulnerable to the bombs and V-weapons of the German War Machine. Volunteers were arranged as the building was vulnerable to fire and despite a number of unexploded bombs, it survived the conflict. For centuries St Paul's was the tallest building in London until 1963, when this title would be snatched by the Millbank Tower.

Open Monday to Saturday, times vary. Tickets start at £20.50 per adult.

The extravagant exterior of Audley House, one of the most impressive surviving pieces of Stuart architecture

3 AUDLEY END
SAFFRON WALDEN

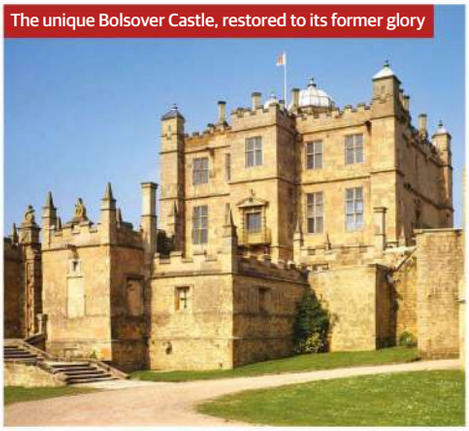
Audley End house in Saffron Walden, Essex is renowned as one of the most famous and luxurious pieces of Jacobean architecture. The house was built on the site of Walden Abbey, which had been granted to Sir Thomas Audley following the Reformation in 1538. While Audley first built a house on the site, it was the rebuilding by his grandson Thomas Howard, First Earl of Suffolk, between 1605 and 1614 that resulted in the grand Jacobean manor that can be seen today.

In 1667 Audley End was purchased by Charles II. During the previous years of Cromwell's reign, the historic Royal Palaces had been sold off or destroyed. According to English Heritage, Audley End proved an attractive property to the King due to its relative closeness to Newmarket and Charles's affinity for the races. Although some improvements were made during this time, the monarchy eventually seemed disinterested in the house and in 1701 it was returned to the Howard family, after which it gradually reduced in scale.

The house's historical importance extended far beyond the Stuart period and, according to English Heritage, was used during World War II as a training ground for members of the Polish resistance. The house is also renowned for its beautiful gardens and grounds, designed by the famous landscaper Capability Brown in 1763, elements of which have been restored.

Audley End is open 10.30am to 4pm Monday to Sunday. Adult tickets cost between £20 and £23.

The unique Bolsover Castle, restored to its former glory



4 BOLSOVER CASTLE
CHESTERFIELD

In 1612 the ruins of a late 11th or 12th century castle provided the ultimate foundations for Charles Cavendish's lavish and extravagant country retreat. Designed to mimic a Norman keep, Cavendish's ideas were certainly unusual though unfortunately he would not live to see its completion. Charles's son, William Cavendish, the 1st Duke of Newcastle, set about completing the project. However, during the English Civil War Cavendish was a key commander of the Royalist forces and his home was forfeit. Despite its ruin during the conflict, Cavendish set about restoring the property in the 1660s.

According to Historic UK the design was heavily influenced by the work of Inigo Jones and the castle's many wall paintings are renowned for their beauty. Bolsover Castle was donated to English Heritage in 1945 and has, since then, been properly restored and is now open to the public. There are also luscious gardens, the Fountain Garden having been replanted with period appropriate plants.

Open 10am to 5pm Monday to Sunday. Adult tickets are between £14 and £16.

5 ST STEPHEN WALBROOK
LONDON

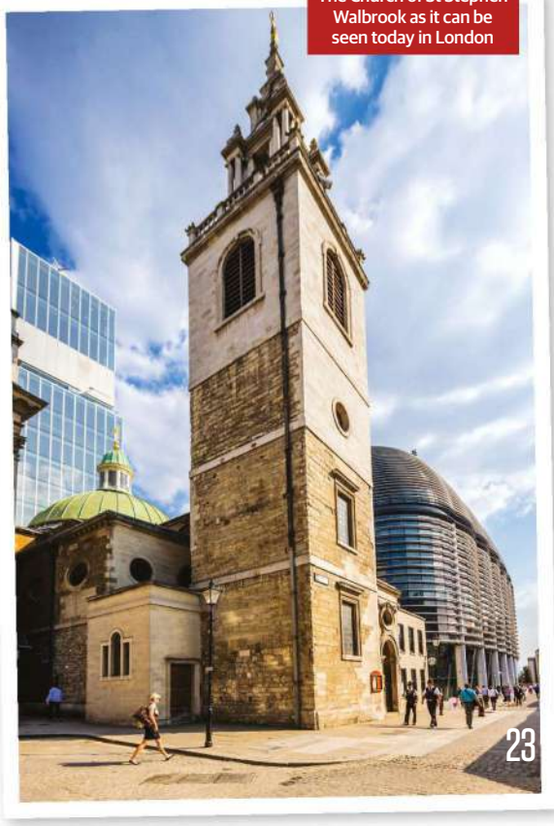
A Christian church had stood on the site of St Stephen of Walbrook since 1090 CE but like St Paul's Cathedral, it was similarly destroyed during the Great Fire of London. Once again Sir Christopher Wren was chosen to design the new structure. However, doubtless Stephen Walbrook would have had a special importance to Wren as it was the parish church he himself attended. It is speculated that it might be this personal connection that led to St Stephen's unique design.

Although the church itself would be finished in 1679, the steeple would prove problematic and would not be completed until c.1713-1717, according to St Stephen Walbrook's official site.

In successive centuries an organ would be added to St Stephen's, as well as mosaic paving stones alongside a variety of other additions and alterations. During World War II, stained glass added during the Victorian era was destroyed and replaced during the 1960s. The church remains a popular site due to its unique Stuart architecture.

St Stephen Walbrook is a working church and as such the opening hours vary. Please check before travelling.

The Church of St Stephen Walbrook as it can be seen today in London



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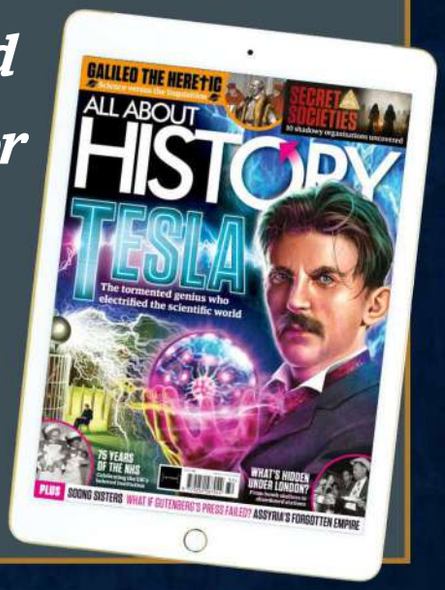
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TESLA

The tormented genius who electrified the scientific world

Written by Callum McKelvie

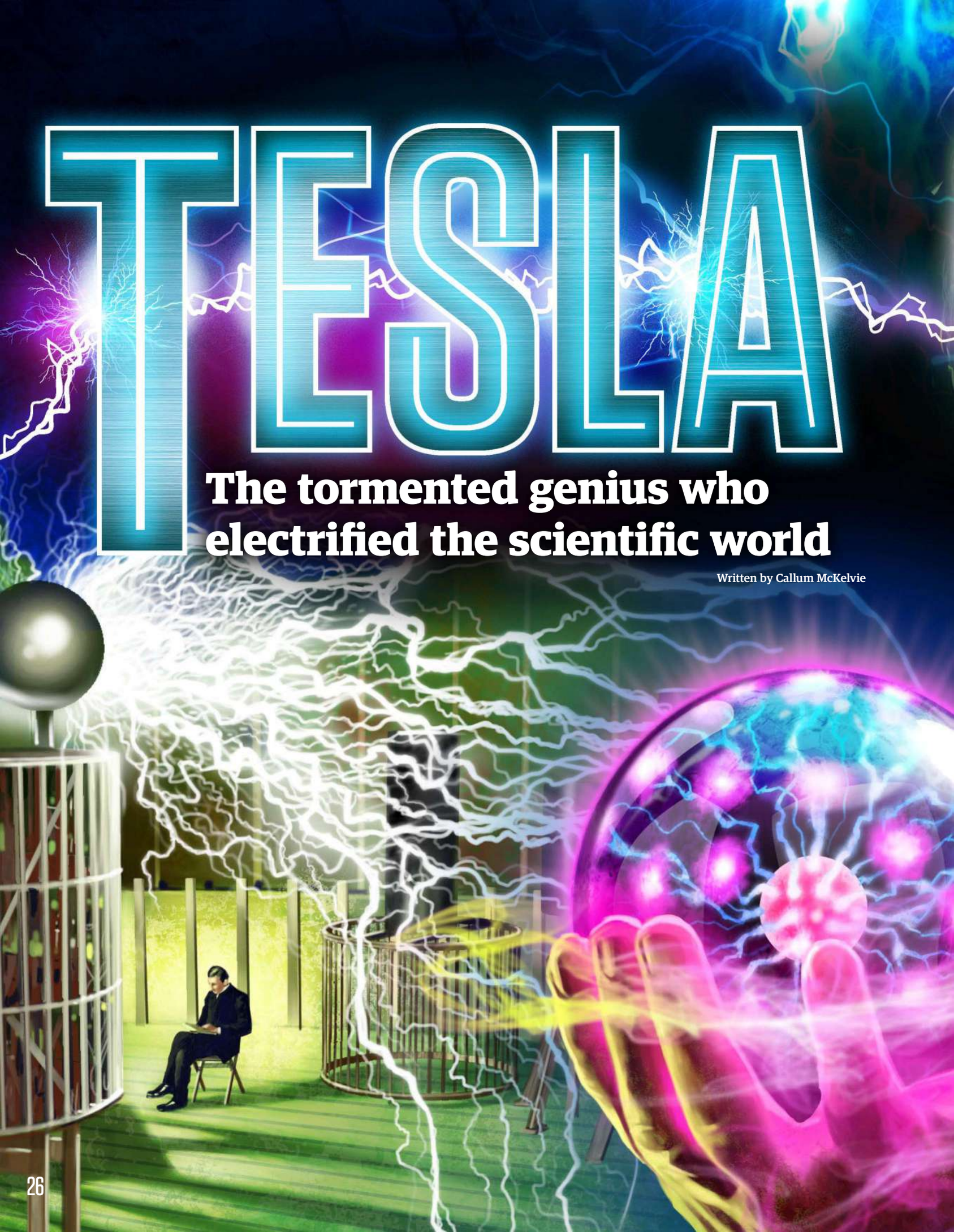
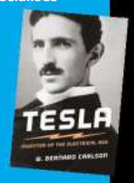


Illustration by Joe Cummings

EXPERT BIOS

W BERNARD CARLSON

Professor at the University of Virginia, Carlson specialises in the history of technology. He is the author of *Tesla: Inventor Of The Electrical Age*, available now from Princeton University Press.



MARC SEIFER

Seifer is an author who has published a number of books on many subjects. He is the author of *Wizard: The Life & Times Of Nikola Tesla* and *Tesla: Wizard At War*, both available now. Learn more at: www.marcseifer.com

You might drive one of the cars, maybe you've heard of the coil, but just how much do you really know about the late 19th century inventor and technological wizard Nikola Tesla? Mostly remembered for being part of an epic struggle against the American inventor of the light bulb, Thomas Edison, that tale is largely exaggerated as are many connected to the life of the Serbian-American genius. He spoke of creating wireless power, death rays and even flying machines, yet Nikola Tesla was no crank. Certainly a one-of-a-kind mind, he was the creator of the AC power, induction motor and hydroelectric power systems, inventions that helped shape the world as we know it.

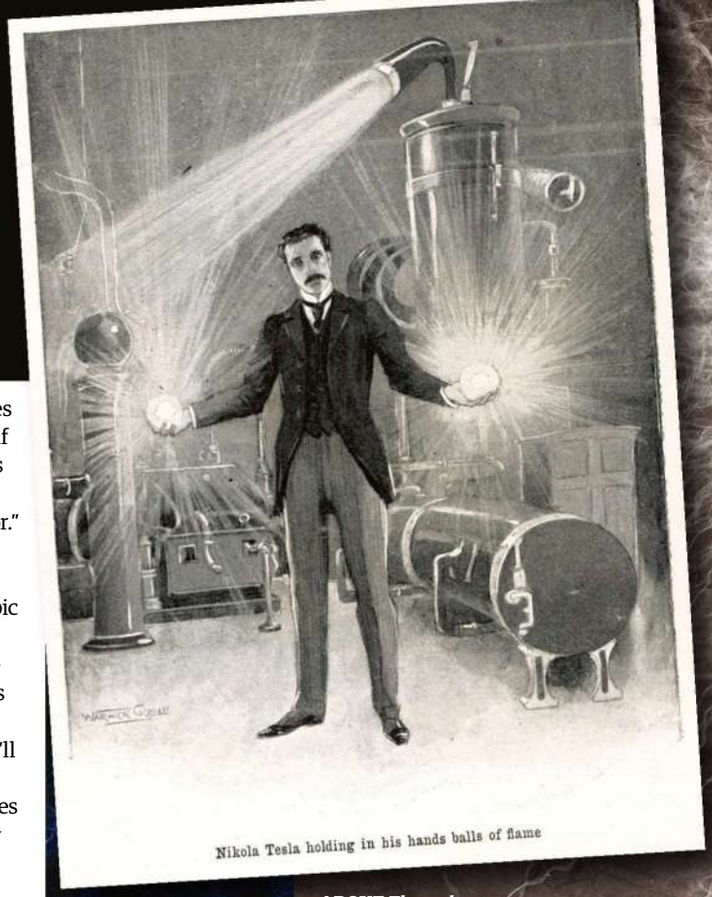
Nikola Tesla was born at midnight between 9 and 10 July 1856 in Smiljan in the Austrian Empire, in what today is Croatia. Part of a large family, he was one of five children. However, tragedy struck when his older brother Dané was killed while Tesla was just a child. This incident turned out to have a profound effect on the young Tesla. "Dané sadly died quite young in a horse riding accident and his parents were absolutely devastated," begins historian W Bernard Carlson, author of *Tesla: Inventor Of The Electrical Age*. "But young Nikola was traumatised. He had an eidetic memory. For example, if you told him to think about a juicy apple, he could visualise that apple in front of him. So after his brother died, his mind was flooded with horrific images and he would get terrible nightmares that overwhelmed him." Tragedy aside, however, Tesla's imagination – once he had learned to control it – would soon become one of the inventor's greatest gifts.

"ĐUKA TESLA WAS SOMETHING OF A TINKERER HERSELF, CREATING NUMEROUS DEVICES TO HELP AROUND THE FAMILY HOME"

But where did Tesla's love for electronic innovation and invention come from? Partially it was from his mother. Đuka Tesla (born Đuka Mandić) was something of a tinkerer herself and created numerous devices to help around the family home. Purportedly she once even constructed a mechanical eggbeater. Secondly, it came from his previously mentioned imagination and a young boy's desire to fly. "When Tesla was about 11 or 12 years old he decided that he wanted to build a flying machine," Carlson explains. "We don't have any sketches but the description sounds like a helicopter backpack. To power the backpack, Tesla designed some sort of vacuum pump and although it didn't produce enough power to take off – the blades did move. This convinced him that if you could imagine it, then there was a possibility it could be built and set him on the path to being an inventor."

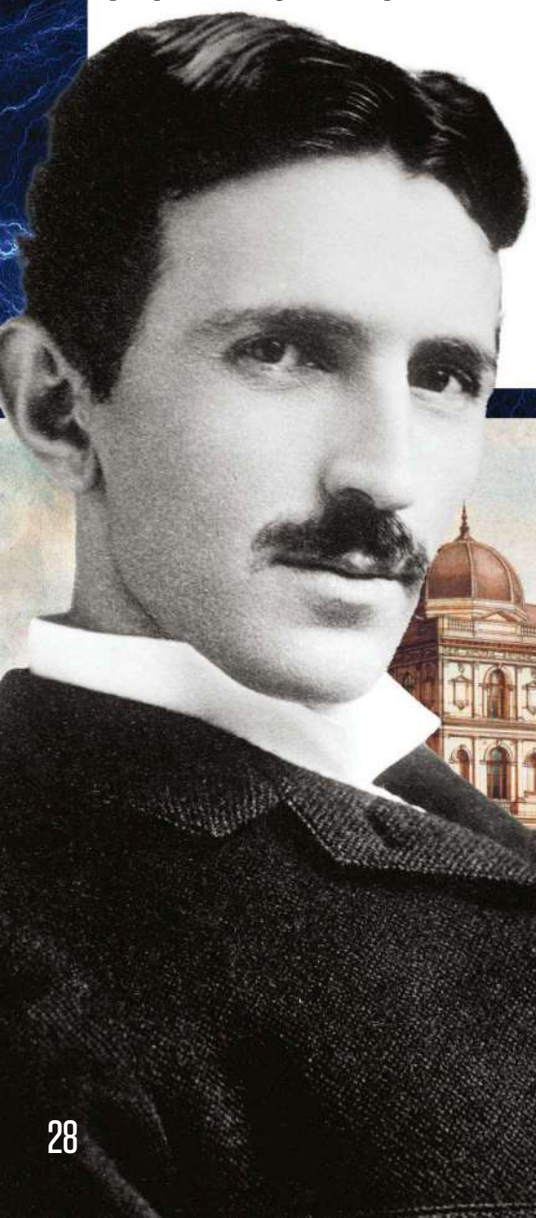
Upon completing his secondary school education, the young Tesla returned to his family home in Gospic where he caught a nearly deadly bout of cholera. When it seemed the young man was on his deathbed, his grief stricken father was prepared to agree to anything. "His father says 'I'll do anything, anything! If you'll get better'," says Carlson. "So Nikola states that what he really wants is to study mathematics and science. So when his health does improve his father arranges for him to go to the Graz University of Technology [previously known as the Polytechnic School] in Austria, where he has a scholarship."

However, by his third year the young inventor was struggling and would never graduate. According to the *Smithsonian Magazine* it's possible dreams of inventions obsessed him and interfered with his studies. Upon the loss of his scholarship he may have battled with a gambling addiction and suffered a breakdown, although he did continue his schooling at the University of Prague where he took courses in experimental physics, higher mathematics, and philosophy.

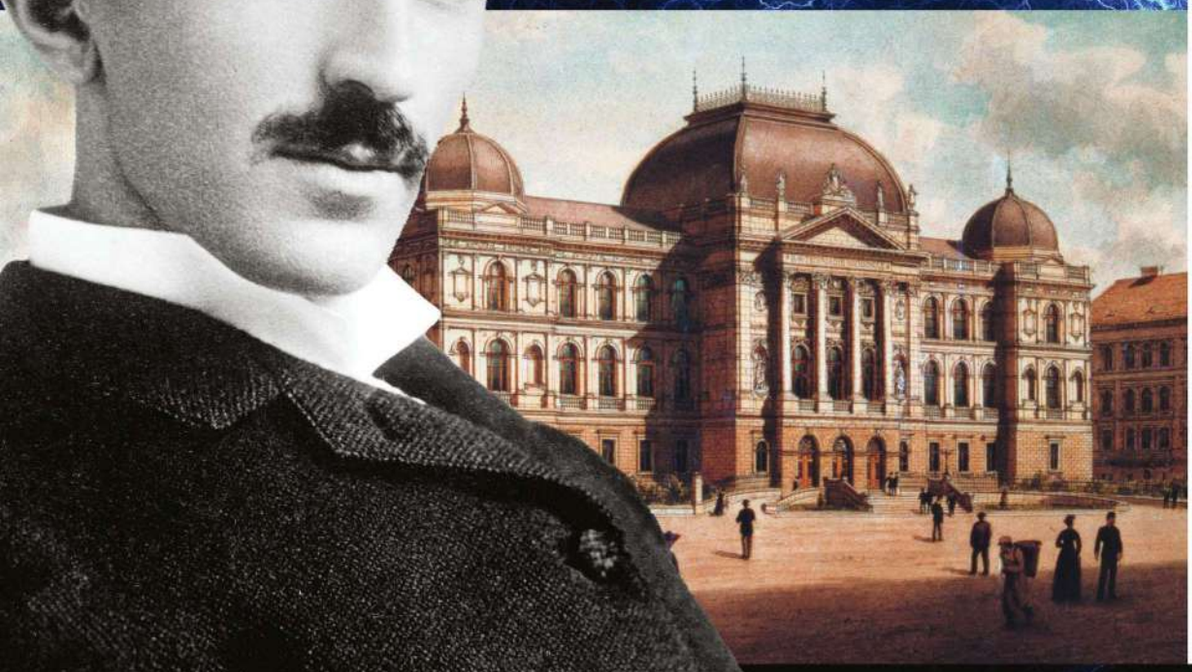


ABOVE Throughout his life Tesla had a reputation as something of an eccentric

RIGHT The large Tesla coil the inventor constructed in his Colorado Springs laboratory



LEFT Tesla was frequently complimented on his good looks and handsome features



BELOW As a young man Tesla attended a technical university, though was forced to quit before completing his studies

In 1881, he moved to Budapest to take a position as a draftsman at the Central Telegraph Office, but it did not take long for his talent to be recognised. According to Tesla's own account, the Inspector in Chief quickly engaged him in assisting with the technical aspects of new installations at the facility. Due to his success here, Tesla was then invited to Paris where he worked under Charles Batchelor for the Edison Continental Company. It would be Batchelor who recommended Tesla to go to America with, as Tesla himself put it, "a view to redesigning the Edison machines".

At age 28, Tesla sailed to America on 6 June 1884 with four cents and a handful of poems in his pocket. However, according to the *Smithsonian Magazine*, he was also armed with a letter of recommendation from a family

friend and early promoter of Edison's work, Tivadar Puskas, to Thomas Edison that stated: "My Dear Edison: I know two great men and you are one of them. The other is this young man!" Suitably intrigued, the technological giant saw fit to employ the eager Tesla. "He begins to work in one of Edison's factories, not in the laboratory, but he's a pretty good troubleshooter," Marc Seifer, author of *Tesla: Wizard At War*, explains. "If things are not working right with Edison's generators or his lighting system then, despite being unsuccessful in getting Edison interested in his new AC motor, Tesla is able to do the practical engineering to fix Edison's existing equipment and make it more efficient."

An important event in the winning of Edison's confidence was Tesla's fixing of problems occurring aboard the SS Oregon. The generators on the ship were proving faulty and causing much frustration. As it was Edison's company who had supplied the generators, there was the possibility of great embarrassment if they could not be repaired. Sensing his opportunity, Tesla went aboard to see what could be done. By his own account Tesla met Edison when he left the ship after completing the work at 5am the following morning. Edison joked that he had spent the night in New York's taverns and bars, not expecting he had been working. When Tesla informed him that the ship's electricity was now functioning, Edison turned and silently walked away. But when he thought the young genius could no longer hear him, Tesla heard Edison state to a companion: "that is a damn good man."

By Tesla's own admission his hours for Edison were long, beginning the day at 10am and working until 5am the following morning. He pushed himself, though he seems to have enjoyed his time there and genuinely admired the man he worked for.

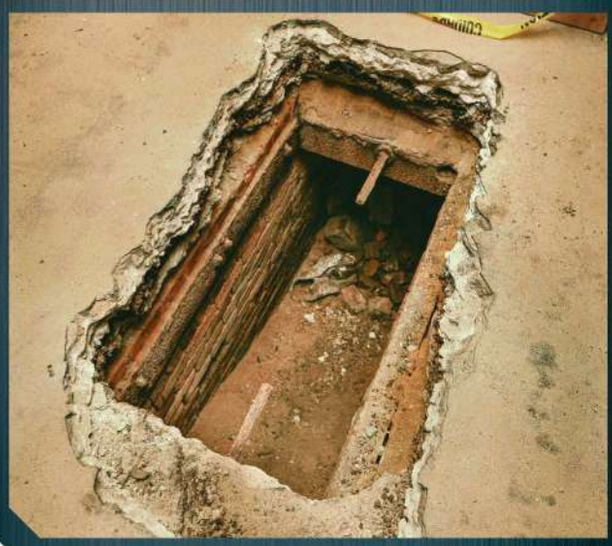
WARDENCLYFFE REDISCOVERED

Once the site of Tesla's tower, his laboratory was recently renovated during which several mysteries were uncovered

Tesla acquired the Wardenclyffe laboratory, the site of his famous tower, in 1901 and with the backing of investor JP Morgan, construction took place over the next five years. The facility would prove to be one of the last projects designed by the legendary architect Stanford White before his murder in 1906.

After it was abandoned, Tesla's Wardenclyffe laboratory was a sorry monument to the inventor's genius. However, in 2012 a campaign was launched to renovate the site. The intention is to make it the home of a permanent museum to Tesla and his life. Wardenclyffe is now the home of the Tesla Science Center. The battle to occupy the site took the group nearly two years.

Yet there is one mystery that still surrounds the Wardenclyffe laboratory to this day. In 2017, according to the Tesla Science Center's site, a film crew working with Marc Seifer for the TV show *The Tesla Files* were able to use radar to prove the existence of a series of tunnels underneath the Wardenclyffe site, though a 2016 paper by Peter J Hutchinson and Alex Balog claimed that electrical imaging had already proven their existence somewhat. However, the exact purpose of the tunnels remains unknown with Hutchinson and Balog stating their purpose may have been to increase deep earth coupling or "initiate standing waves for the projection of electricity to remote locations."



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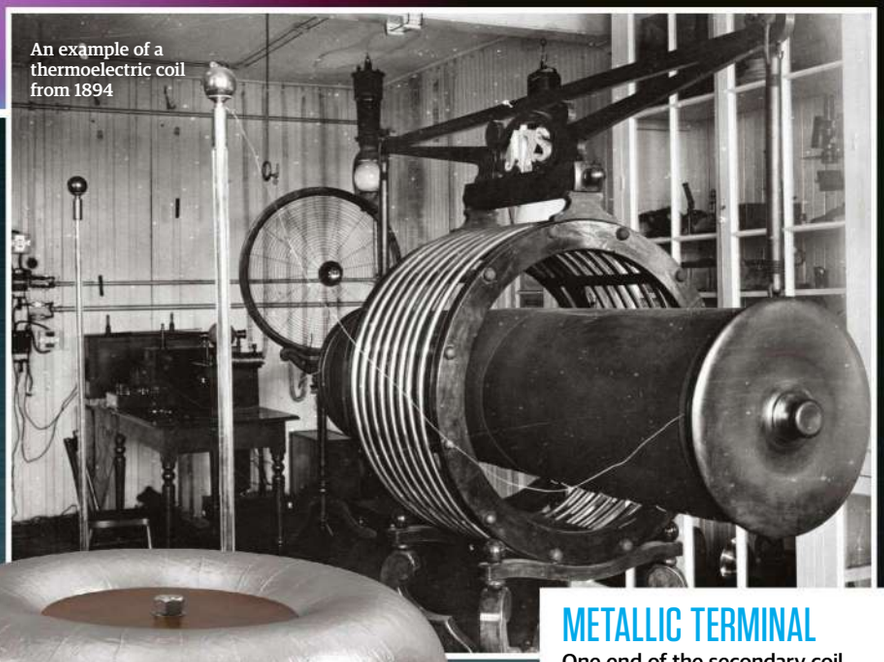
INSIDE A TESLA COIL

W Bernard Carlson explains how Tesla's most amazing invention worked

A Tesla coil takes ordinary household alternating current (110-220 volts, 60 cycles) and boosts the current to thousands of volts and thousands of cycles. This allows the Tesla coil to create giant sparks and other remarkable effects.

A Tesla coil consists of several components, all carefully adjusted to work with each other: an input transformer, capacitor, primary coil, secondary coil, and large metallic terminal.



An example of a thermoelectric coil from 1894

SECONDARY COIL

This is wound with fine wire. Because the primary coil has a few turns of thick wire while the secondary has hundreds of turns of wire, the two coils together boost the high-frequency voltage to thousands of volts.

METALLIC TERMINAL

One end of the secondary coil is grounded (not visible) but the other end of the coil is connected to a large metallic terminal. The high-frequency, high-voltage current builds up electrical charge in this donut-shaped terminal, and if another metal object is brought close to the donut, a spark will jump between the two.

INPUT TRANSFORMER

This device takes household current and steps it up from 110-120 to several hundred volts.

PRIMARY COIL

This is the horizontal coil of thick copper wires. When it receives the capacitor's high-frequency current, it induces a current in the secondary coil. Together, the primary and secondary coils function as a transformer.

RESONANCE

The secret of the Tesla coil is that the capacitor, primary coil, and secondary coil are carefully adjusted so that each increases the frequency and the voltage. It's much like the idea that if you are pushing a child on a swing, and you want the swing to go higher, you time your pushes to when the swing comes all the way back so that you add energy at just the right moment. Scientists call this resonance.

CAPACITOR

The high-voltage current from the input transformer is next fed into the capacitor. The capacitor stores the current that gradually builds up. When the capacitor reaches its capacity, it discharges the current at a higher frequency to the primary coil.

TOP Tesla put on dazzling exhibitions of his work with electricity

INSET George Westinghouse, whose contract Tesla tore up, walking away from millions of dollars

ABOVE Tesla's Wireless Broadcasting Tower from around 1907

Trouble, however, was on the horizon. "The Edison company hadn't done anything with arc lights because they were primarily concerned with incandescent lighting systems," Carlson tells us. "However, they felt they needed an arc lighting system in order to compete with the other electrical manufacturers." Eagerly, Tesla began designing the required system, spurred on by the excessive fee promised to him. "He was told he was going to be paid $50,000 for the system," Carlson continues, "but upon delivery, the Edison company said, 'you don't understand our sense of American humour, we're not going to pay you $50,000 and furthermore we don't even need the system anymore'." Furious, Tesla left the company and took his arc light system elsewhere.

So where then does the long-held notion that Thomas Edison stole from Tesla come from? It would seem that this moment would be the source of this legend, with the idea that in refusing to pay the promised $50,000, the Edison corporation was attempting to steal Tesla's arc light system. "The story is far more complicated than people like to admit," Carlson explains. "Tesla walked out with the intellectual property that he developed while he was working for the Edison company, and they were never really fond of Tesla as a result of that."

"TESLA RESORTED TO TAKING WORK DIGGING DITCHES FOR THE MEASLY SUM OF $2 A DAY"

Out of a job and penniless, Tesla resorted to taking work digging ditches for the measly sum of $2 a day. Yet he still spoke openly of his work for Edison among his colleagues and when the foreman of the yard caught wind of his concept for an induction motor, he introduced him to AK Brown. Brown was the manager of the Western Union Telegraph Company and saw in Tesla an underappreciated genius whose talents were being squandered. Brown took a shine to the young man and assisted in not only providing him with financial support for appropriate living quarters but also helping create the Tesla Electric Company. With his newly rented laboratory, Brown requested that Tesla continue to work on the alternating current system that had occupied so much of his time. Brown's generosity and faith in Tesla and his work, as well as his belief in the concept of the motor, rescued the inventor from both financial squalor and creative despair.

Dutifully, Tesla used his new company to work on the AC power systems. Between 1887 and 1888, according to Carol Dommermuth-Costa in her work *Nikola Tesla: A Spark Of Genius*, he is said to have been granted over 30 patents for his inventions. At the time, Tesla's further development of a workable AC motor was a watershed moment in a series of events that has become known as the War of the Currents. Edison's company was pursuing the use of direct current, whereas his rival George Westinghouse was

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LEFT Tesla sitting in front of one of his massive coils from his high-frequency transformer

ABOVE Engraving's of the inventor carrying out experiments in the late 1800s

"ONE NIGHT TESLA DISCOVERED STRANGE SIGNALS COMING THROUGH HIS RECEIVER, WHICH HE DEDUCED WERE COMING FROM ANOTHER PLANET"

setting out to prove that alternating current was in fact a superior system. When Westinghouse discovered Tesla's invention of a motor that could successfully operate using AC, he had to have it. "Using Tesla's system they discovered you could potentially send energy hundreds of miles, and not just for lighting homes but eventually for running things like toasters, vacuum cleaners and entire factories," explains Seifer. "So it really was the difference between a horse and buggy and a rocket ship, there was simply no comparison between the two systems."

Working with Westinghouse, he and Tesla scored a key victory over Edison when they were granted the contract for the 1893 World's Fair, otherwise known as the Columbian Exposition. According to the Tesla Science Center, various entrepreneurs and inventors had been invited to submit bids for the opportunity to power the lighting systems for the event. By underbidding Edison, Westinghouse won, and using Tesla's patent for his AC motor and power system illuminated the prestigious fair in spectacular fashion. Two years later, another victory arrived for team AC when they were requested to install the generators at the Niagara Falls Power Station. The facility was a monumental step forward in the use of hydroelectric power systems. In a speech opening the station, Tesla proclaimed: "It is a monument worthy of our scientific age, a true monument of enlightenment and of peace. It signifies the subjugation of natural forces to the service of man, the discontinuance of barbarous methods, the relieving of millions from want and suffering."

Surely with such successes to his name, Tesla was destined to become a rich man? The original contract Tesla had with Westinghouse promised him $2.50 for every horsepower of electricity on all motors produced. However, when Westinghouse came to Tesla and informed him that the contract was providing his company with a wealth of financial difficulties, Tesla did the unthinkable. According to John Joseph O'Neill in his 1944 book, *Prodigal Genius: The Life Of Nikola Tesla*, the inventor gave a long speech lauding his friendship, at the climax of which he stated: "The benefits that will come to society from my polyphase system mean more to me than the money involved. Mr Westinghouse, you will save your company so you can develop my inventions. Here is your contract and here is my contract – I will tear both of them to pieces and you will no longer have any troubles from my royalties. Is that sufficient?"

ABOVE An illustration of Nikola Tesla lecturing to the French Physical Society and International Society of Electricians

One might assume, that having already proved that AC current was superior, that Tesla might be content to rest on his laurels but not so, he was already considering the next form electrical conduction would take. In 1891, he had previously begun to dabble with this notion when he had invented possibly his most iconic creation, the Tesla coil. According to the *Smithsonian Magazine*, these devices could generate high voltages of electricity as well as new forms of light, such as X-rays and even made it possible to send and receive radio signals. They were also a key part of the next technological leap Tesla wished to make: wireless power.

In order to convince the public of the possibility of wireless power, he would hold breathtaking demonstrations. "He did a series of dramatic public demonstrations intended to get people to think about the possibilities of wireless power," Carlson tells us. "He would walk on stage, fire up the Tesla coil and it would make lights go on and off all across the auditorium. He'd put his hand on one end of the coil and

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hold a light bulb in the other and the bulb would illuminate brilliantly."

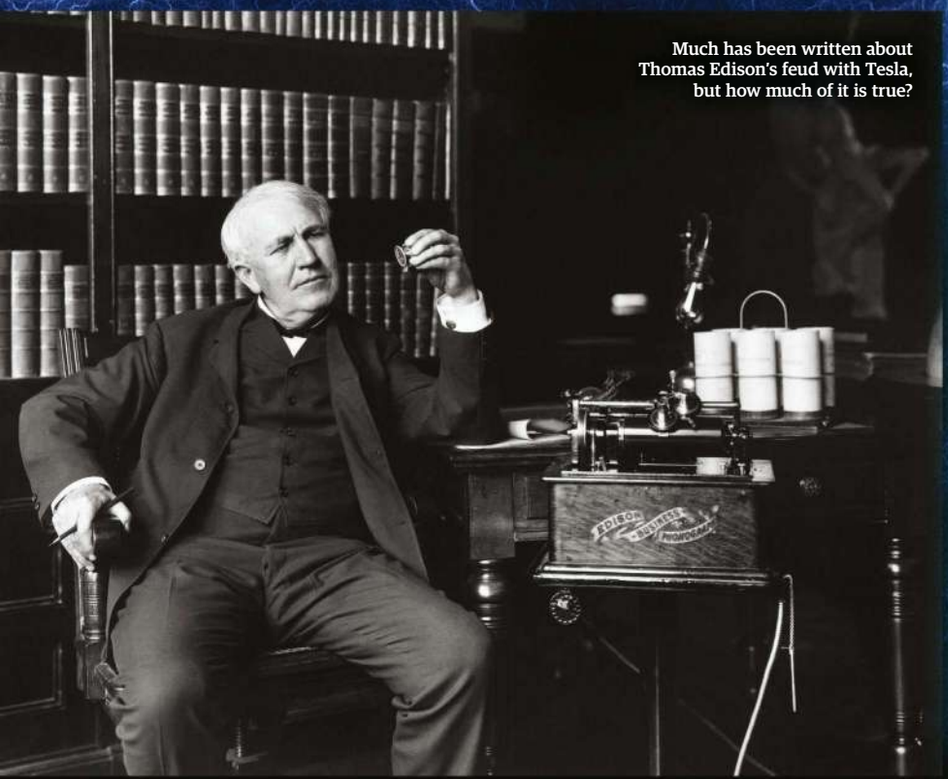
In 1899 Tesla moved for a single year to Colorado Springs where he set up the Tesla Experimental Station. "Once there he built the largest Tesla coil ever," says Carlson. "There are amazing pictures of Tesla with these giant lightning bolts flying over his head. But most of the time he had it set up so you wouldn't see those giant sparks because they are essentially a leak in the system, it's energy going to waste. But Tesla arranged for the photographs to be made, because they were great publicity and any investor would get the sense of the tremendous power of the device. In other words, it captures the imagination."

It was in Colorado Springs one night that Tesla detected strange signals coming through his receiver, which he deduced were coming from another planet. However it is now suspected they were caused by Io, one of Jupiter's moons. Shortly after Tesla left Colorado Springs, the remaining lab equipment was auctioned off and the building torn down. All that remains there today is a plaque in his memory.

In 1900, Tesla formed a partnership with the enterprising JP Morgan to further explore his innovative idea of wireless power. Morgan agreed to fund the construction of the Wardenclyffe Tower. The Tesla Science Center, housed today at Wardenclyffe, states that as well as proving the possibility of wireless power, Tesla intended the tower to serve as a prototype for a "global wireless communications system". The concept grasped the public imagination and the 22 May 1904 edition of the *New York American* ran a story on the tower that carried the strap line: "Amazing scheme of the great inventor to draw millions of volts of electricity through the air from Niagara Falls and then feed it out to cities, factories and private houses from the tops of the towers, WITHOUT WIRES."

Yet Tesla soon encountered trouble from his financial backers when Morgan stopped the completion of the Tower. The exact reason for Morgan's

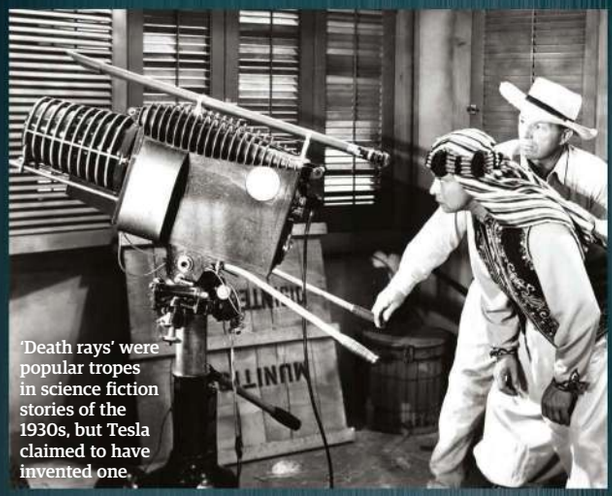
"TESLA'S REPUTATION AS A GENIUS AHEAD OF HIS TIME HAS INCREASED TO OUTSHINE THAT OF HIS SUPPOSED RIVAL"



Much has been written about Thomas Edison's feud with Tesla, but how much of it is true?

TESLA AND THE DEATH RAY

As Tesla reached the end of his life, he conceived of a unique weapon – the 'Teleforce'



'Death rays' were popular tropes in science fiction stories of the 1930s, but Tesla claimed to have invented one.

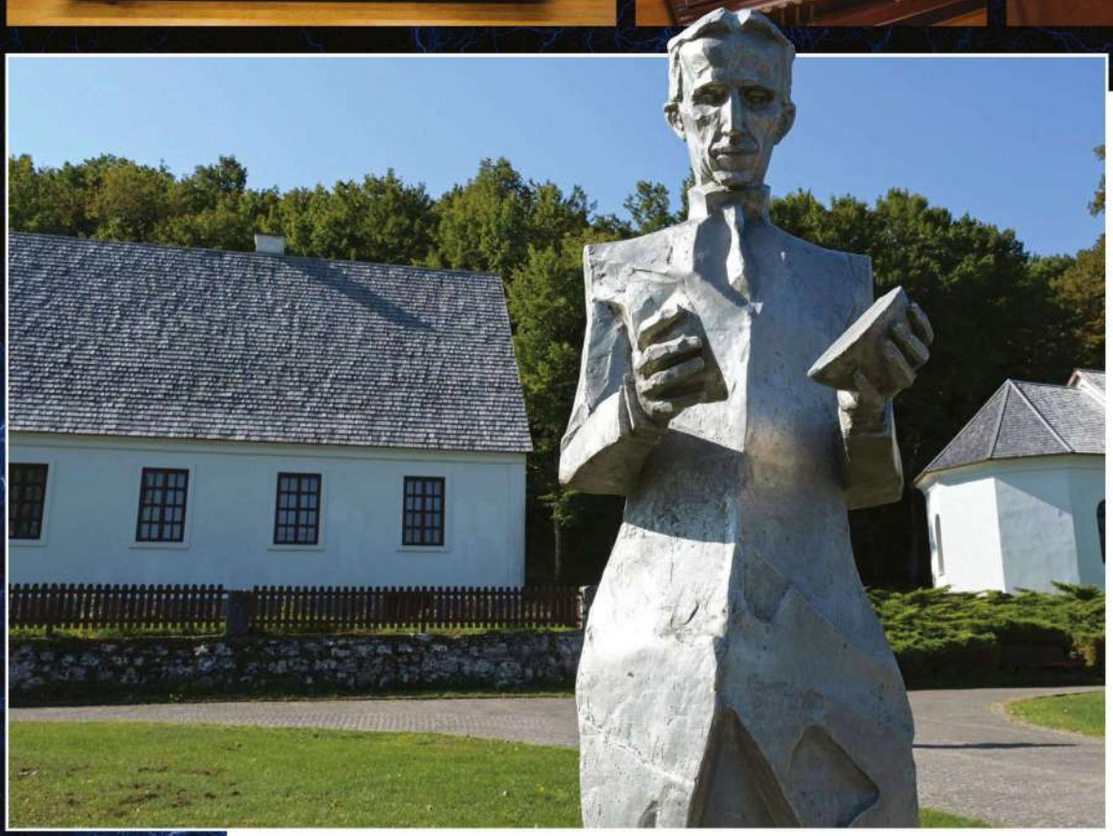
"There is this myth that Tesla, in the years before his death, was an old man feeding the pigeons and basically living the life of a hermit in New York," says Marc Seifer. "But what I discovered when researching my book *Tesla: Wizard At War* was that this wasn't strictly true." The final years of Tesla's life during the 1930s are often overlooked, his increasingly outlandish designs and inventions dismissed. Yet in Seifer's research he discovered that one of these creations was actually taken very seriously indeed – the Teleforce, or particle beam weapon.

"If you send a very powerful beam of electricity it will spread out the further it goes," Seifer explains. "So Tesla came up with the notion of a Particle Beam weapon, with the particles being tiny little pieces of tungsten. He uses an electrical stream of negative energy, set up to a very high potential, and when you put in negatively charged particles of tungsten they'll repel out the cannon. That's what the Teleforce was."

Tesla was confident in the device, even referring to it as a 'super weapon to end all war'. But funding was nonexistent until in 1935 he received an offer from the Soviet Union to purchase plans and schematics for $25,000, though little information regarding their experiments remains. However, in 1939 when World War II broke out, Tesla did not give in trying to sell his device to other nations.

"I discovered letters between Tesla and the British War Office stating that he wanted to sell the weapon to Great Britain," Seifer reveals. "The fear was that if the Nazis attempted to invade Great Britain, they would use aeroplanes, bombers and V2 rockets. As the Particle Beam weapon could concentrate it could theoretically knock planes out of the sky." However while representatives from Great Britain and the United States did meet with Tesla, nothing came of the weapon.

"What I tried to show in my book is that Tesla is not just some old guy who disappeared from history," Seifer concludes. "He may have been in his 80s, but he was trying to help the Allies beat the Nazis and save the world."



TOP Examples of Tesla's machines can be found in museums around the world

ABOVE Under-appreciated at the time of his death, in the decades since he has been honoured with statues

intervention remains unclear, though Marc Seifer in his book *Wizard At War: The Genius, The Particle Beam Weapon And The Pursuit Of Power*, suggests that the initial reason given was due to Tesla intending to build a tower twice the size of the one that Morgan had consented to build. Despite Tesla's constant begging of Morgan to change his mind, the investor remained steadfast. The tower would remain standing until 1917 when it was demolished.

Tesla never seemed to have much luck when dealing with investors. He also certainly had a reputation as an eccentric and the stories of his unusual traits and quirks are almost endless. Purportedly, he detested the sight of pearl earrings on a woman, rarely slept and worked long and unusual hours. He is also said to have been obsessed with numbers 3, 6 and 9 and may have even believed that these numbers held the key to the universe, giving birth to a whole host of bizarre theories and conspiracies. The question remains then, did his eccentricities affect his reputation and, crucially, his work?

"Tesla certainly was eccentric," Seifer explains. "He liked to circle the block three times. He seemed to avoid shaking hands (sometimes but not all the time) and he was a bit obsessed with cleanliness later in life. But did it interfere with his work? I think in a certain way it did. But jealousy was also involved. At the Westinghouse Corporation, there was one group who was very much in awe of Tesla and another group that were jealous and tried to strip him of the accolades that he really deserved."

As per the stories of his eccentricities, Tesla spent the final years of his life feeding and - purportedly - claiming to communicate with the pigeons of New York. Although supposedly having a fondness for these creatures all throughout his life, it was only said to have increased during his later years. However, the inventor was not forgotten by the public and appeared on the cover of *Time* magazine in 1931 to celebrate his 75th birthday. He also continued to theorise new inventions, including a 'death ray' that has been the source of much speculation. However, due to his mishandling of his finances he remained relatively poor. On 7 January 1943 Nikola Tesla died of coronary thrombosis, at the age of 86.

In the years since, his reputation as an innovative genius and revolutionary inventor has grown to be widely appreciated. While Edison may have held greater fame and fortune during his lifetime, Tesla's reputation as a genius ahead of his time has increased to outshine that of his supposed rival. This fact is proven by one of the world's largest automobile manufacturers, owned by one of the richest men on the planet, taking its name from Nikola Tesla.

"When things are a little uncertain and the economy seems to be letting us down, the heroes that come forward are the visionaries, because we need to believe that technology is going to rescue us once again," says Carlson. "We are enamoured with Tesla's vision because it was about helping humanity. It's about clean, wireless energy, it's not about industry, factories or profit."

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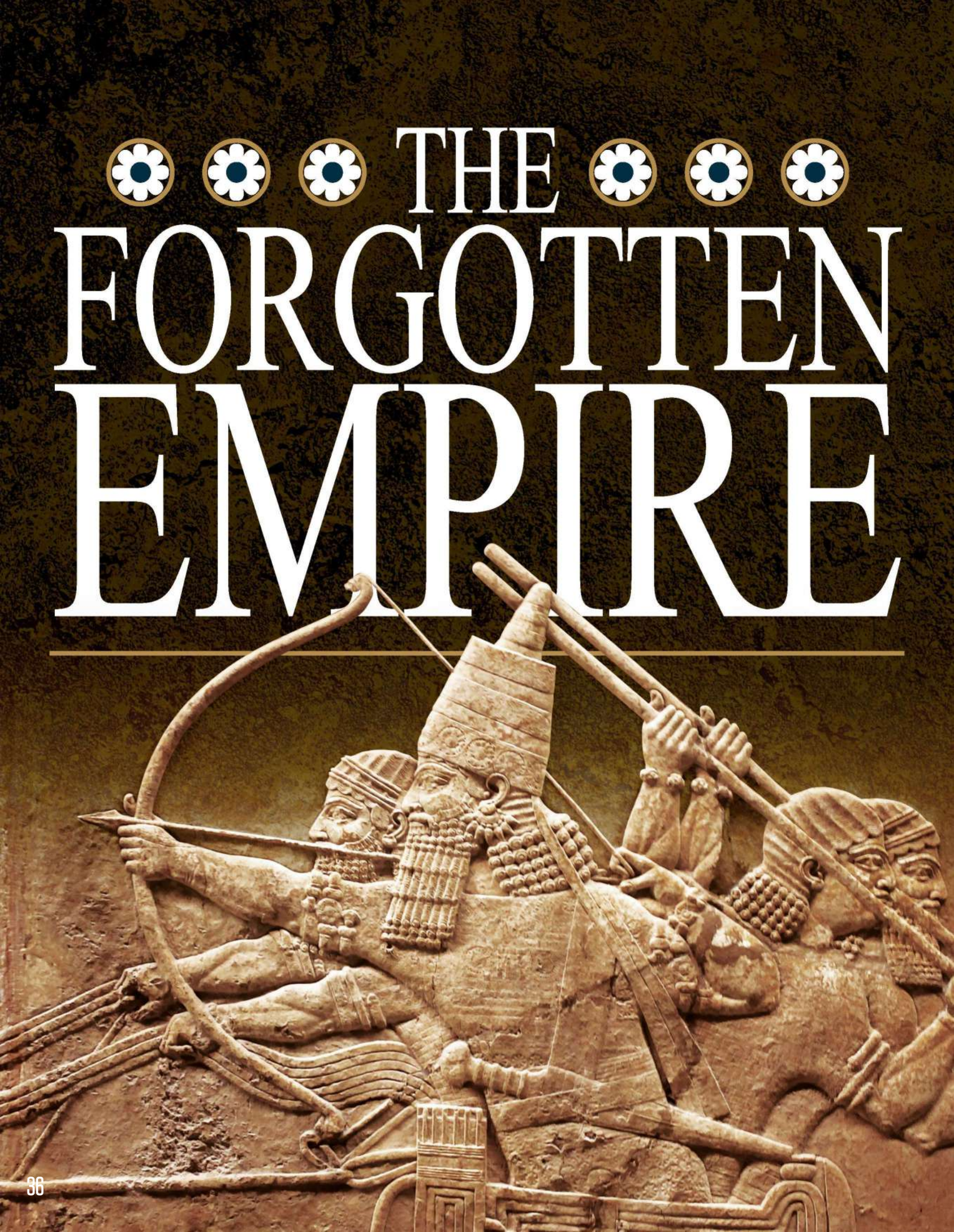
THE FORGOTTEN EMPIRE



Mark Healy reveals why the Assyrian Empire was a power to be reckoned with

Written by Jonathan Gordon

The great civilisations of ancient Mesopotamia are often overlooked or play supporting roles in the history of neighbouring powers, but the ancient Assyrians were a remarkable people. Between 912 and 612 BCE in particular, in what is called the Neo-Assyrian period, at its height this kingdom ruled from the Mediterranean to the Persian Gulf and from the Red Sea to the Caspian Sea and is considered by some to be the first world empire in history. We spoke with Mark Healy, author of a new book on the empire called *The Ancient Assyrians*, to dig into how they built such an extensive powerbase and how it collapsed very suddenly.

What attributes made the Assyrians unique among their contemporaries that helped them build their empire?

I think a number of things: ruthlessness, particularly. I think they were pretty efficient when it came to the use of the military. They clearly thought about their army in a way which doesn't seem to have been the case with their opposition. The core of their army was fully professional and I think they thought pretty carefully about things like tactics and how best to use the forces in battle. I also think a major factor would have been their development of an independent cavalry arm, which would have been the first in history and the progenitor of all the types of cavalry arms that came afterwards.

Author photograph by Paul McKay, © Mark Healy

EXPERT BIO

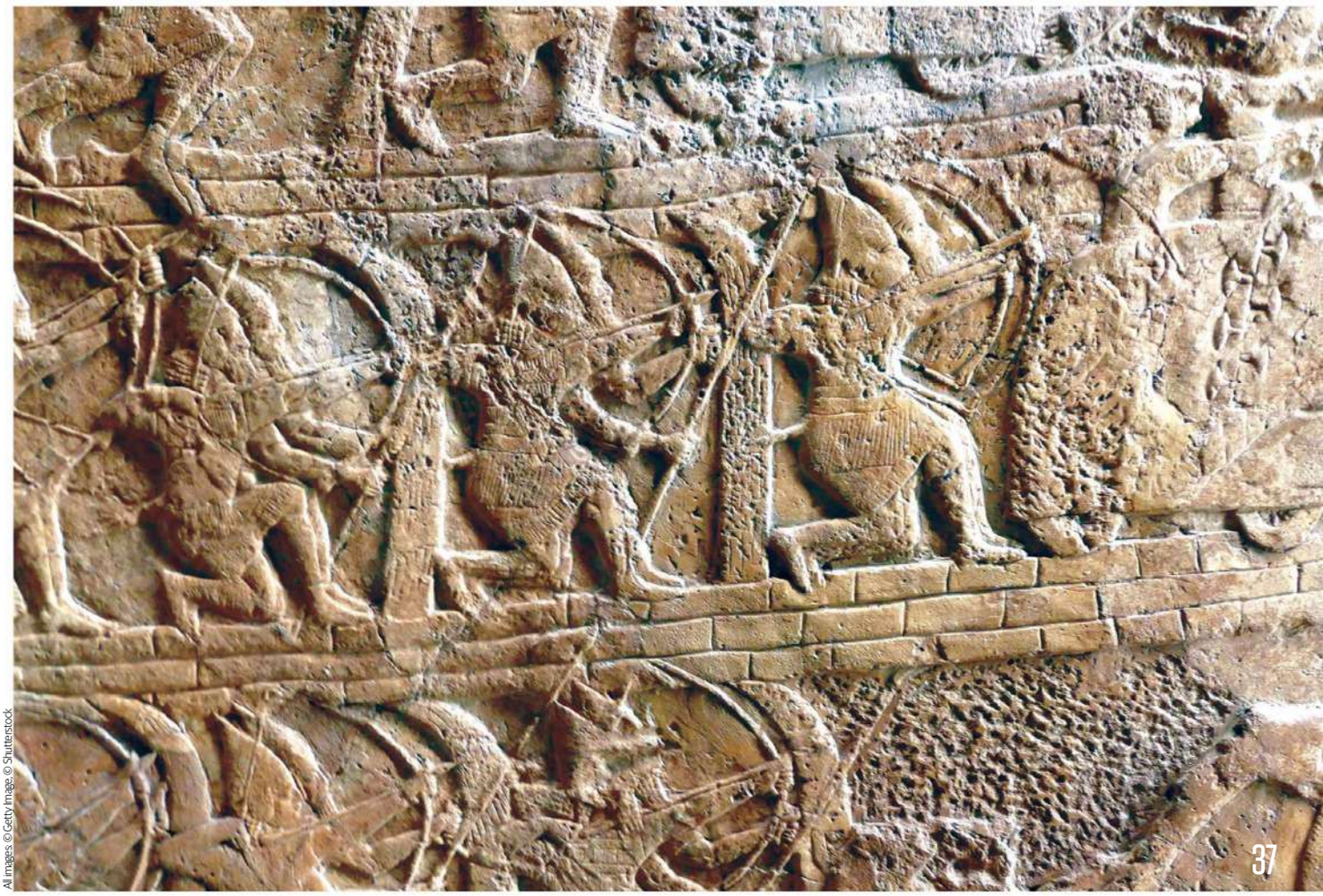
MARK HEALY

Mark Healy is a military history author whose previous works include *Panzerwaffe: The Campaigns in the West 1940*, *Midway 1942*, *Cannae 216 BC* and *Warriors Of The Old Testament*. His new book, *The Ancient Assyrians* is out 20 July 2023.

How did the Assyrian Empire compare in terms of its economy or its agricultural base to its regional neighbours of the period?

What we do know is that for the first two centuries of the Neo-Assyrian Empire, rainfall was very high, which led to very high grain harvests. I make the point at the beginning of the book that the grain harvest was so important to the Assyrian kings and allowed their troops to be given food to conduct the campaigns. Where they had famines, they obviously couldn't provide food for the soldiers any more than for their population, which is where you tend to see a decline in Assyrian military actions. Assyria itself, when the rains fell and the crops regularly appeared on an annual basis, was a very fertile part of the ancient Near East, and was a fairly major factor in underpinning the ability of the Assyrian army to go to war on such a regular basis. That being said, most of the resources that were needed by the ▶

BELOW A relief of Assyrian archers attacking the city of Lachish in the Kingdom of Judah in 701 BCE



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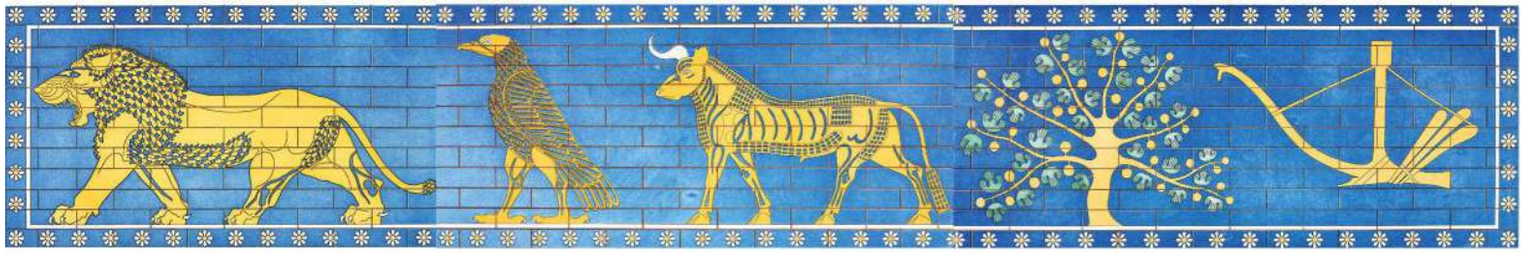


Assyrian army to equip its army were taken from other cultures, other polities, and certainly part of their imperialistic expansion was to locate and gain control of sources of the resources necessary to feed their army.

You also mention the role of climate change in your book on the fortunes of the Assyrians. Could you tell us a little about that?

One of their earlier kings, Tiglath-Pileser I, who was credited with being essentially the founder of what they call the middle empire, during his reign you see clear evidence of climate decline. The

> "THE IDEA THAT CLIMATE CHANGE MIGHT HAVE BEEN THE MAJOR FACTOR IN THE DECLINE OF THE ASSYRIAN EMPIRE IS QUITE A MODERN NOTION"

rainfall drops. He talks about massive famines, he talks about cannibalism amongst the people of Assyria. Assyria contracts until such time as it really comprises what we call the core of Assyria, which was the triangle roughly from Nineveh in the north, to Arbela in the east, down to Ashur in the south. And it was this way for nearly 100 years before the rains began to return. The idea that climate change might have been the major factor in the decline of the Assyrian Empire is quite a modern notion. I came across this by reference to a geophysical paper published by a team that worked out of California University, and they had done work which studied deposits found in stalactites and stalagmites in the northern Iraqi caves. What they discerned was that the period that equated to the 7th century, roughly 699 through to 612 BCE, when the Empire collapsed, the evidence suggests a remarkable decline in rainfall – it would have meant that there would not have been reliable and regular harvests of wheat and of barley, and that would have fundamentally undermined the ability of the Assyrians to put into the field large numbers of soldiers.

ABOVE
A reconstruction of an enamel decoration from the harem of Sargon II

Are there any key figures from the Neo-Assyrian period that you would like to highlight?

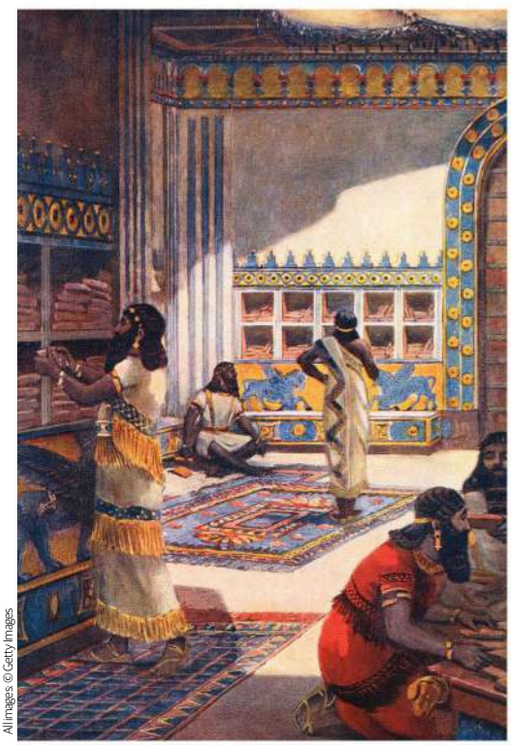
The Assyrian king Tiglath-Pileser III, who came to power in Assyria via a coup in 746/745 BCE, is regarded as one of the great figures of the ancient world. It was under Tiglath-Pileser III that you saw the transition of Assyria from being primarily a tribute generating power to that of a proper empire, with the territories that were conquered being transformed into provinces with governors. These governors under him were eunuchs because their loyalty would be to the crown and not to their families or perpetuating their own private little dynasties. The Imperial model, which is what he introduces, was taken over by the Medians and then taken over by the Persians. So, the Assyrians not only created innovations in the military, but also innovations in the manner in which conquered territories were administered, and instead of levying tribute on territories they conquered, they taxed them. You see the model that later becomes commonplace under the Romans.

The king after him, Sargon II, becomes one of the great conquerors along with Tiglath-Pileser III. Then after Tiglath-Pileser III you have Sennacherib who obviously comes in for a

BELOW-LEFT
The famous library of Ashurbanipal, a collection of clay tablets discovered in the ruins of Nineveh

BELOW-MIDDLE
Tiglath-Pileser II rides into the conquered city of Sarrapanu having crucified its king

BELOW-RIGHT
The city of Sidon is destroyed after the failed rebellion of the Sidonian king Abdi-Milkutti in 677 BC



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bit of bad press in the Bible. Then it's his son Esarhaddon who conquered Egypt. And finally you have the last great king of Assyria, Ashurbanipal, who is more tied up with his library. When Austen Layard excavated Nineveh in the 1850s and they discovered vast quantities of cuneiform tablets, this came from what is now called Ashurbanipal's library. The guy was different to other Assyrian kings in that he is thought to be literate in cuneiform, and other forms of early writing. One of his real interests was in collecting ancient Sumerian texts. It's from his library discovered by Austen Layard that we have the earliest form of the Sumerian flood story.

You've written about a number of different military history topics, both modern and ancient histories. What is it about Ancient Assyria that brings you back?

Well, my academic background is theology with history. I went to do history, but I found the history a bit boring and discovered I could do more interesting history with theology, and Old Testament Biblical Studies. It was in doing that work that I came across the Assyrians and I've always been interested in military history. I just found them to be a quite fascinating people. We have so much information about their military, the wall reliefs for example, which you can see in the British Museum.

The Assyrians were unique in being one of the few cultures who have made their armies the subject of their artwork. It is clear that the Assyrian kings were most concerned that the scribes and the artists – and they must have taken artists with them on campaign – transcribe images of their soldiers such that they accurately depict how they look, how they work, and how they fight. So, what we have over the periods of the three centuries of these wall reliefs are images of the development of a military, which is unmatched until such time as we go through to late Greece or the Romans.

What do you hope readers will take away from your new book, The Ancient Assyrians?

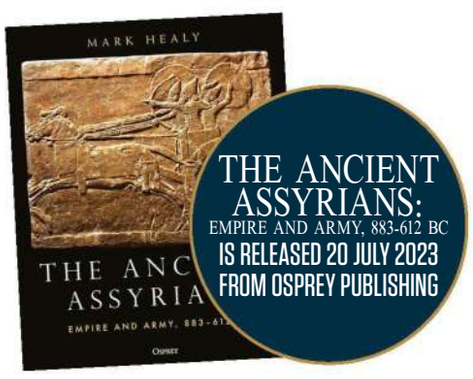
Well, I still think it's the case that most people's acquaintance with the Assyrians tends to be from the Bible. Although I have a theological background, I'm not religious myself and I accept that the biblical writers' principal concern was theological, not historical. History tends to get tweaked to reflect the theological prejudice of the authors. If you read the elements of the Assyrians in the Bible, they do come in for a pretty bad press, I think, and most people see them as barbaric, merciless, and bloody minded.

The fact that they were pretty ruthless is accounted for by their religious beliefs. One of the things that I'd like people to perhaps become a bit more familiar with is the notion that at this period, and in fact, throughout the ancient pre-classical Near East, war was essentially religious. It wasn't just the Assyrians who saw themselves executing the will of the gods. Everybody else did too.

I just want people to be informed that there was more going on prior to the Greeks and the Romans than what meets the eye.

TOP The power and wealth of the Assyrian Empire was built on fertile lands and an advanced military structure

ABOVE Reliefs from the ancient Assyrian era were among the artefacts destroyed by ISIL militants in Syria in 2015



The Soong Sisters

How three women's influence went on to change the course of Chinese history

Written by Poppy-Jay St. Palmer

The Soong Sisters are often summarised through one of Mao Zedong's famous sayings: "One loved money, one loved power, one loved her country." Although very different, these three women led extraordinary lives, nurtured just as extraordinary relationships, and even changed the course of Chinese history. During the early 20th century, opportunities for women were far rarer than they are today. But one way to achieve influence was to marry into it, so the Soong Sisters did just that.

Humble beginnings

The sisters' story begins with their father, Charles Jones Soong (1863-1918). Raised in Hainan, the smallest and southernmost province of the People's Republic of China, Charlie Soong was a peasant boy with big dreams. Following an apprenticeship in the East Indies, he relocated to the United States to be educated and trained as a Methodist missionary. After a brief stint working as a publisher of Chinese Bibles back in Shanghai, he switched gears completely and, with the help of an American patron, he quickly became a wealthy industrialist involved in a number of different businesses.

It was during his time as a publisher that Charlie met Sun Yat-sen, who had been leading a Methodist church service in Shanghai. The two men had a fair bit in common: both were Western-educated Christians, both were members of entwined anti-Qing groups, and both sought political change in China. Hitting it off from the start, newly minted Charlie began ▶

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funding Sun Yat-sen's political campaigns (he was the founder of the Nationalist Party, also known as the Kuomintang), with the plan being to connect their groups into a network of opposition. To the pair's chagrin, their first attempt at an uprising in 1895 was a bust, ending in Sun fleeing the country for 16 years and Charlie going incognito in Shanghai. However, Charlie continued to fund Sun from afar, which allowed the latter to start building more connections for a second uprising attempt. In 1906, Charlie Soong was appointed treasurer of the Revolutionary Alliance. Five years later, the Xinhai Revolution brought about the fall of the Qing Dynasty, and Sun Yat-sen finally became the short-lived first president of the Republic of China in 1911.

During the hiatus, Charlie established the Soong family with his wife Ni Kwei-Tseng, a member of China's most illustrious Christian clan, Xu. In the 1890s, the happy couple welcomed three sons (TV, TL, and TA) and three daughters (Ai-ling, Qingling and Mei-ling). Wanting his daughters to follow in his footsteps, Charlie sent each of them to be educated in the United States. The two eldest, Ai-ling and Qingling, attended Wesleyan College, a private Methodist college in Georgia and the first higher-education institution in the world to offer degrees to women. The youngest, Mei-ling, enrolled as a freshman at Wesleyan, but later transferred to Wellesley College in Massachusetts to be near her brother TV, who was studying at Harvard University.

ABOVE The Soong Sisters' father wanted them to receive a Western education

Big sister Ai-ling

Following graduation, all three sisters returned to China. Ai-ling, who had a mind for finance and business, accepted a job working as Sun Yat-sen's secretary, and was responsible for handling his correspondence, which included secret messages from the republicans that required decoding. It was during this time that Ai-ling formed a strategic relationship with businessman and eventual Minister of Finance HH Kung, whose claims to fame were being a descendant of Confucius, as well as the richest man in the country. The couple married, and Ai-ling quickly made a fortune of her own through her business, the Sandai Company. In his book *The Penguin History Of Modern China*, Jonathan Fenby writes: "[Kung] would sit at home and conduct various negotiations about revaluing the currency, or doing this, that or other. And [Ai-ling] would be taking notes, and get on the phone to her broker afterwards and place large investments."

Middle sister Qingling

Ai-ling's marriage to Kung meant that it was no longer appropriate for her to work as Sun Yat-sen's secretary. According to Jung Chang's book *Big Sister, Little Sister, Red Sister*, both Ai-ling and Kung shared a deep dislike for Sun's war against President Yuan. Ai-ling's position was eventually taken over by the middle Soong sister, Qingling, who at the time was 21 and living in Tokyo with her parents. However, Qingling and Sun's relationship quickly evolved into a romance, despite the fact that Sun was much older than Qingling and already married to another woman. Qingling's family deeply disapproved of the pairing for these reasons, even though Sun and Charlie Soong had been great friends and colleagues. In an attempt to stop the blossoming relationship, Charlie moved the family back to Shanghai. However, Qingling and Sun secretly remained in touch, not willing to let their connection die.

"Secretly the young woman modelled herself on Joan of Arc, and identified with heroines who fought for a 'cause' and

"One loved money, one loved power, one loved her country"

BELOW Gaining influence as a benefit of their marriages, the Soong Sisters made waves in 20th century China

Meet the Soongs

Your quick guide to the main players in the story of the Soong Sisters

Charlie Soong/Soong Yao-ju
- Father -
Born: 1863, Hainan
Died: 1918, Shanghai
Political alignment: Kuomintang (National Party of China)
Occupation: Businessman, politician

Ni Kwei-Tseng
- Mother -
Born: c.1869
Died: c.1931

Soong Ai-ling
Born: 1890, Shanghai
Died: 1973, New York City
Political alignment: Kuomintang
Occupation: Businesswoman

Soong Qingling
Born: 1893, Shanghai
Died: 1981, Beijing
Political alignment: Kuomintang, Communist International, Revolutionary Committee of the Chinese Kuomintang
Occupation: Political leader

Soong Mei-ling
Born: 1897, Shanghai
Died: 2003, New York
Political alignment: Kuomintang (Nationalist Party of China)
Occupation: Politician

TV Soong/Soong Tzu-wen
- Brother -
Born: 1894, Shanghai
Died: 1971, San Francisco
Political alignment: Nationalist Party
Occupation: Financier, government official

TL Soong
- Brother -
Born: 1899, Shanghai
Died: 1983

TA Soong
- Brother -
Born: 1907, Shanghai
Died: 1969

HH Kung/Kung Hsiang-hsi
- Ai-ling's husband -
Born: 1881, Shanxi
Died: 1967, New York
Political alignment: Kuomintang
Occupation: Banker, finance minister

Sun Yat-sen
- Qingling's husband -
Born: 1866, Kwangtung
Died: 1925, Peking
Political alignment: Kuomintang, Chinese Revolutionary Party, Chinese United League, Revive China Society
Occupation: Statesman, physician, philosopher

Chiang Kai-shek
- Mei-ling's husband -
Born: 1887, Zhejiang
Died: 1975, Taipei
Political alignment: Kuomintang
Occupation: Statesman, military leader

embraced self-sacrifice," wrote Jung Chang about Qingling. It seems only natural that she would be so intoxicated by Sun, the enemy of the president of China. Eventually, Qingling escaped her parents in the dead of the night, caught a boat to Tokyo and eloped with her love. Charlie was so betrayed by her defiance that he disowned her and cut all ties with Sun.

The age gap between Qingling and Sun ultimately became their downfall, and the bride became a widow when Sun died in 1925. However, Qingling remained politically active, supporting the left wing of the Nationalist Party after it split with the right wing, which was later headed by Chiang Kai-shek, a no-nonsense military man many viewed as a fascist. When the left wing purged their communist members in 1927 to reunite with the rest of the party, Qingling was enraged and denounced the organisation all together for betraying the ideals of its founder, her late husband. She left China for the Soviet Union and remained there for two years as a committed Leninist.

Little sister Mei-ling

The Soong's family dynamics became even more complicated when the youngest sister, Mei-ling, married Chiang Kai-shek, the new Nationalist Party leader that her middle sister had denounced. According

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The Soong brother

The tale of Ai-ling, Qingling and Mei-ling's slightly less remarkable brother, TV Soong

The Soong Sisters put their family's name in the history books, but they weren't the only Soong children with influence. Their brother TV Soong, born Soong Tzu-wen, also made waves within the Chinese government. Like his sisters, TV received a Western education. Unlike his sisters, however, he attended Harvard University, which didn't admit women at the time.

After returning to China, it wasn't long before he joined the banking and financial circles, which set him up to follow in his father's footsteps financing the Kuomintang. He also teamed up with his brother-in-law, Sun Yat-sen, to establish the Central Bank of China at Guangzhou in 1924, which later became a central bank of issue and government treasury. The following year, TV became finance minister in the new Nationalist government, and began working with his other brother-in-law, Mei-ling's husband Chiang Kai-shek, soon after. In this role, TV was responsible for reforming the taxation system, abolishing the likin and readjusting foreign and domestic debts. He is also credited with negotiating with foreign powers to return tariff autonomy to China after it was taken by Western nations during the 19th century.

TV resigned from his role in 1931, owing to now being fabulously wealthy, but he quickly returned to government work and helped his country's efforts during the Sino-Japanese War through negotiating with foreign powers. He continued putting his mediation skills to use all the way up to the communist capture of mainland China. Like Mei-ling and Ai-ling, he eventually moved to the United States for good, and continued to dabble in business and banking until his demise in 1971, when he choked to death on a piece of chicken while attending a San Francisco dinner party with the chairman of the SF branch of Bank of Canton.

to Jonathan Fenby, Chiang, a military man, had long wished to join the Soong-Sun circle to help his political career. This union was also met with disapproval from the Soong parents, owing to the fact that Chiang was a fair bit older than Mei-ling, already married (he had been married three times before) and a practising Buddhist. However, Charlie and Kwei-Tseng finally agreed when Chiang showed them proof of his divorce and promised to gradually convert to Christianity. The couple wed, and Mei-ling adopted a new name: Madame Chiang. As her husband became Generalissimo of the Kuomintang, Mei-ling assisted in his battle against Mao Zedong's communist forces by acting as his English translator, secretary and advisor. She also introduced him to Western ideas and culture, and helped to publicise his cause in the West. Chiang eventually became the president of the Republic of China, elected five times over and serving for a total of 46 years, and Mei-ling became the country's First Lady.

In her new capacity as a politician, Mei-ling quickly put her influence to use. In 1934, she attempted to halt the spread of communism by teaching traditional Chinese values through her New Life Movement programme. She even negotiated Chiang's release after he was taken captive by warlord Chang Hsüeh-liang, who believed the Nationalist government should stop fighting China's communists in favour of resisting Japanese aggression. During World War II, she wrote articles on China for American journals and became the first Chinese national and second ever woman to address both houses of the US Congress. Throughout the Sino-Japanese War, she acted as something of an ambassador for her country and even started a welfare project that established schools for 'warphans', the orphans of Chinese soldiers that were killed in battle.

The Chinese Revolution

Throughout the 1940s, Nationalists and communists battled for control of China. When Chiang's forces were defeated and Mao Zedong declared the creation of the People's Republic of China in 1949, things between the Soong family got even more tense. While Mei-ling and her husband attempted to stop the spread of communism, Qingling had become honorary chairwoman of the Revolutionary Committee of the Kuomintang, a new left-wing splinter group of the Kuomintang, the year before. After the Nationalist Party's collapse, she was a guest at the ceremony marking the birth of the People's Republic of China in Beijing's famous Tiananmen Square. When Mao proclaimed the founding Proclamation of the People's Republic of China, Qingling was mentioned as a vice-chairperson alongside five others. Qingling was seen as a link between Sun Yat-sen's movement and the recent victory, and was therefore held in great esteem by other communists. The pinnacle of her career came in 1959, when she was elected Vice President of the People's Republic of China alongside Dong Biwu, a senior Communist Party 'elder'. Shortly before her death in 1981, Qingling was named Honorary Chairwoman of the People's Republic of China. She is still the only person to ever hold this title.

Qingling's sisters' lives and careers in the run-up and aftermath of the Chinese Revolution were vastly different from her own. During the Sino-Japanese War, Ai-ling and her husband Kung used their money and influence to help their people.

BELOW Though they often clashed, the sisters reunited briefly to defeat a common enemy during World War II

ABOVE A photo of Soong Mei-ling (centre) with wives of other Chinese officials

> "One way to achieve influence was to marry into it, so the Soong Sisters did just that"

According to Lily Xiao Hong Lee and Sue Wiles in *Biographical Dictionary Of Chinese Women, Volume 2*, Ai-ling sat on committees set up to help wounded soldiers. She played an active role in raising large sums of money and donating quilts, warm clothing, ambulances and trucks. However, while doing good, Ai-ling and Kung also tried their hands at some creative accounting. The couple and their children were eventually accused of graft, corruption, black-marketing and war profiteering: they had been compiling huge sums of money by playing the bond and foreign exchange markets with insider information. The family was disgraced by this revelation, and Kung was even asked to step down as the Republic of China's Minister of Finance in 1944.

Still sickeningly wealthy, they transferred their immense fortune and business abroad and left their home for the United States, where they remained for the rest of their lives. They continued to dabble in politics, and even backed Richard Nixon in his bid for president in exchange for his support of the Kuomintang. Ai-ling finally died in 1973 at New York-Presbyterian Hospital.

Mei-ling also built a reputation for herself in the US, but hers was entirely more favourable than Ai-ling's. Despite falling into politics through her marriage to Chiang Kai-shek, she had become a public figure in her own right. When Chiang was defeated in 1949, he and Mei-ling moved from mainland China to Taiwan to establish Chiang's government. Following her work in the country during World War II, the American public took a shine to the youngest Soong Sister and she found herself in a good position to ask for support from the US government. Her efforts even managed to sway their policy towards China and Taiwan, and she featured annually on the US list of the ten most admired women in the world until 1967. Although she had a good run, Mei-ling's political career gradually fizzled out after the death of her husband in 1975. She emigrated to New York and mostly kept a low profile, jumping back into politics every now and then to lend a hand to causes she supported. After multiple battles with cancer, she died peacefully in 2003 aged 105.

The Soong Sisters' views and relationships pulled them apart, but perhaps it was those turbulent relationships that gave them the drive to maintain their influence not just in China, but also across the globe. Although estranged, each sister played a part in changing the course of Chinese history, just as Chinese women were beginning to gain more independence. They might not have seen eye to eye, but together they welcomed the future.

TOP Mao Zedong greeting Soong Qingling at Mao's Huaihai Road residence in 1961

MIDDLE Madame Chiang reads about Japan's 'complete surrender' in the newspapers in New York, 1945

BOTTOM Revolutionary political leader Sun Yat-sen found himself entwined with the Soong family, working with Charlie Soong and ultimately marrying Soong Qingling

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SECRET S

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Are there secretive groups of people lurking in the shadows who have changed the course of history?

Written by Ben Gazur

It is a common trope of conspiracy theories that there are hidden fraternities meddling in the world's affairs. These secret societies are said to offer a network of power, an exclusive membership, and sometimes mystical knowledge. Despite being called secret, in fact many such groups are well known and have now been extensively studied by historians.

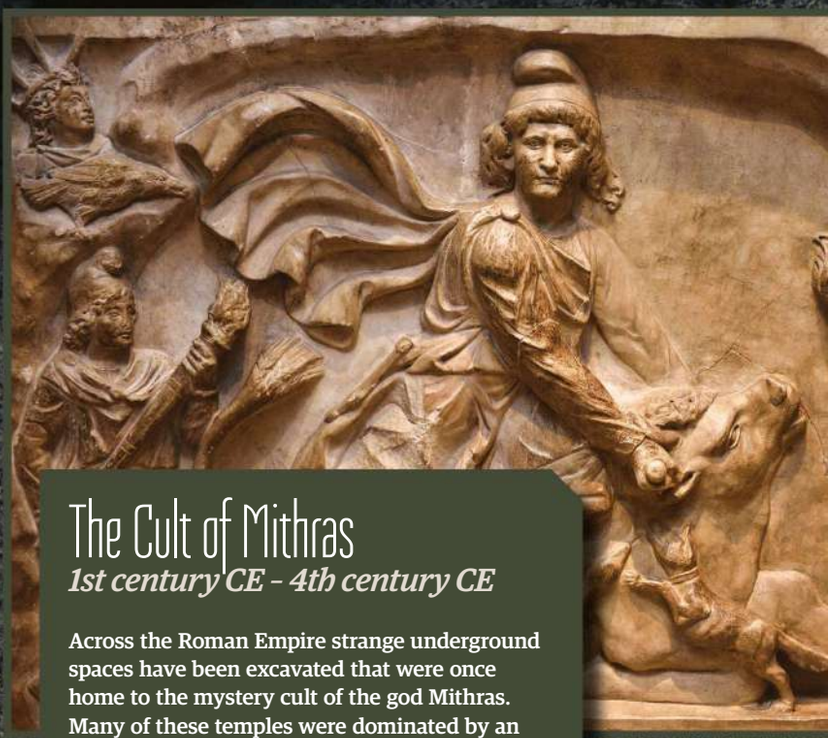
The anxieties surrounding the existence of secret societies is not always unjustified. Many hidden groups have influenced history in unexpected ways. The underground Christians of the early Roman Empire managed to convert the state to their religion after all. Whether in the ancient past or present, nefarious or not, the power and influence of secret societies are waiting to be uncovered.

Eleusinian Cult *Unknown – 392 CE*

21 kilometres outside of Athens lies one of the most important religious sites in the ancient world. Eleusis was home to a temple of the agricultural goddess Demeter. According to the Homeric Hymns the goddess attempted to make Demophon, son of the king of Eleusis, immortal when she grieved the loss of her daughter Persephone to Hades. She also taught the locals certain mysterious rites.

At first the worship of Demeter at Eleusis was a strictly small-scale affair, but when the town became part of Athenian territory its fame grew. Each year people would throng to the temple to be inducted into the Eleusinian Mysteries. Part of the rituals performed there was a solemn pledge never to reveal the secrets that you were taught there. This veil of secrecy seems to have been remarkably effective. The playwright Aeschylus was charged with the crime of leaking some of the mysteries in his play, though he was acquitted. The philosopher Diagoras was less lucky and was executed. No one today can say for sure what occurred at Eleusis.

When Greece was conquered by the Romans many flocked to Eleusis to take part. Everyone from Cicero to the Emperor Hadrian were introduced to the mysteries until it was finally suppressed along with other pagan sects by Emperor Theodosius I in 392 CE.

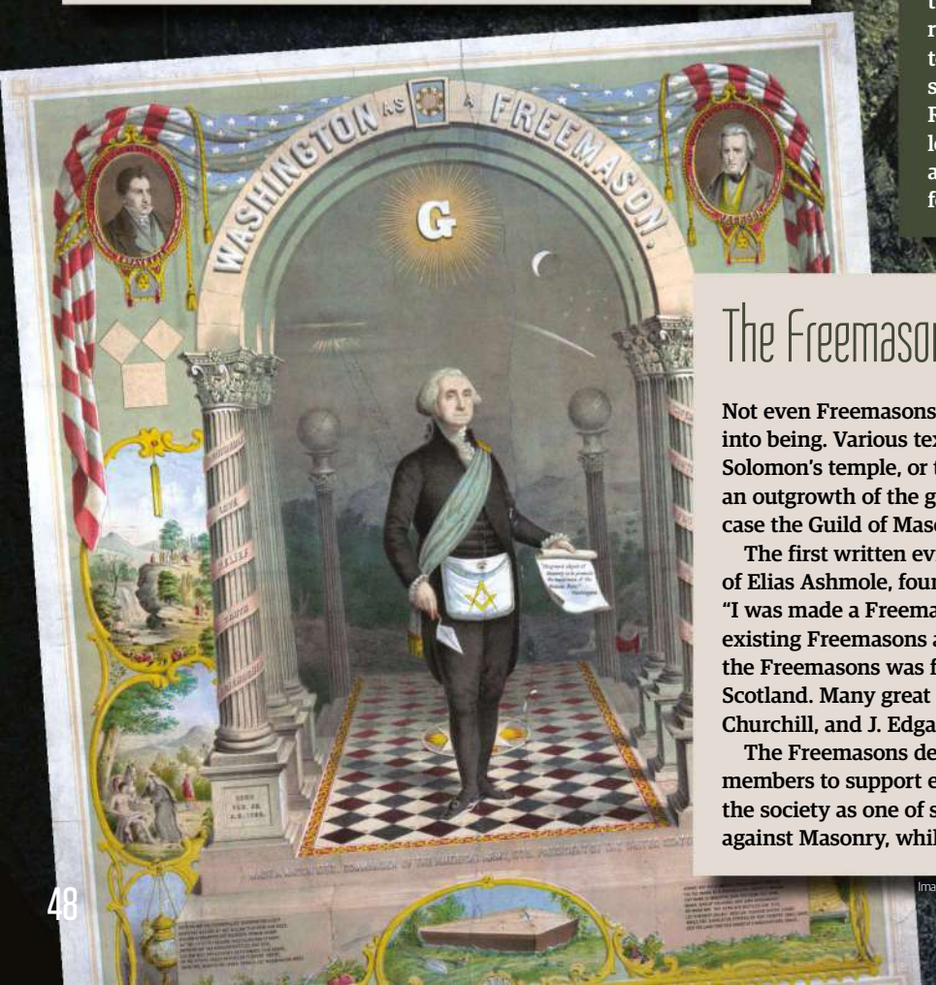


The Cult of Mithras
1st century CE – 4th century CE

Across the Roman Empire strange underground spaces have been excavated that were once home to the mystery cult of the god Mithras. Many of these temples were dominated by an image of the tauroctony – Mithras slaying a bull. Other enigmatic images show Mithras being born from a rock, a snake and a dog licking the bull's blood, and a naked lion-headed man.

The cult seems to have derived from an Iranian god known as Mithra, but it became hugely popular among members of the Roman army and spread to the furthest parts of the empire. Little is known about the belief system of those who worshiped Mithras, but much can be gleaned about the structure of their society.

The remains of food found in temples of Mithras show feasts were carried out inside the temple and this could be related to mythic feast scenes carved at some sites. Lists of members of the cult reveal seven different levels of initiation ranging from Raven, to Persian, to Sun-runner, to Father. All of the names found at Mithraic sites have been male and none come from Roman families of the upper classes. This has led scholars to suggest that worship of Mithras allowed men of the middle and lower classes to form a mutual aid society.



The Freemasons *Unknown – Present*

Not even Freemasons can say for sure when the society known as Freemasonry came into being. Various texts have tried to trace it all the way back to the architect of Solomon's temple, or to the mathematician Euclid. Others prefer to see Freemasonry as an outgrowth of the guilds and lodges that dominated trades in European cities – in this case the Guild of Masons. There is little substantive evidence however.

The first written evidence of Freemasonry as a secret society comes from the journal of Elias Ashmole, founder of the Ashmolean Museum, in 1646 when he recorded "I was made a Freemason at Warrington." This tells us however that there were existing Freemasons at that time to induct him. The first legally recognised lodge of the Freemasons was founded in London in 1717. It soon spread beyond England and Scotland. Many great names like George Washington, Benjamin Franklin, Winston Churchill, and J. Edgar Hoover were all Freemasons.

The Freemasons describe themselves as a philanthropic organisation that allows members to support each other and improve themselves. Anti-Freemasons however see the society as one of shadowy and malign influence. Several popes have issued decrees against Masonry, while both the Soviet Union and Nazi Germany banned it.

Image source: wiki/Library of Congress

The Knights Templar *1119 – 1312 CE*

In the 13th century one of the wealthiest groups in Europe were the 'Poor Fellow-Soldiers of Christ and of the Temple of Solomon,' better known as the Knights Templar. Initially founded to act as protectors of Christian pilgrims as they travelled to the Holy Land, following the capture of Jerusalem in the First Crusade, they soon became a powerful fighting force. With official backing from the Papacy, money and support flooded into the order. They were exempted from paying taxes and were given leave to ignore laws in lands where they operated. With branches across Europe and huge financial assets the Templars often operated as a multinational bank.

The loss of Christian holdings in the Holy Land left the Knights Templar without a clear aim however. Jealousy of their wealth was the undoing of the Templars as King Philip IV of France was deeply in debt to the Templars. He had members of the order arrested. Charges against them ranged from sodomy, to urinating on the cross, to worshipping the Devil. The secrecy of the order left it open to such accusations.

Under torture several Templar leaders confessed to the charges. Some Templars were burned publicly but most were released from their vows or quietly pensioned off. With papal approval their assets were confiscated and the order suppressed across Europe.

The Order of Assassins *c. 1090 – 1275 CE*

In the 1330s a priest called Brocardus described the dangers of venturing into the east. "I name the Assassins, who are to be cursed and fled. They sell themselves, are thirsty for human blood, kill the innocent for a price, and care nothing for either life or salvation." Known as the Assassins, the Hashashin were really a small state founded in 1090 after members of the Ismailis, part of the Shia sect of Islam, captured Alamut Castle. Other castles were soon taken but the Assassins were heavily outnumbered and surrounded by enemies. Without the forces to take on their foes militarily the Assassins turned to political murder to protect themselves.

Only a small number of the Assassins, known as Fida'iyin, actually killed enemies. They did this generally by poison, dagger, and arrow. Once handed a dagger by the leader of the Assassins the killer was said to be entirely dedicated to their mission and care nothing for their own survival. Many important Muslim leaders fell to the blades of the Assassins, such as Caliph Al-Mustarshid, as did later Crusaders like Conrad of Montferrat.

As the Mongols began to sweep westward through Persia many Muslims sought protection with the Assassins but even these feared murderers could not hold back the horde. Their last outpost fell in 1270.

Images © Getty Images

The Illuminati *15th century – Present?*

No secret society is thought to be more powerful than the Illuminati. Prominent conspiracy theorists see it as controlling everything from banks, to governments, to the COVID-19 pandemic. And this fear is not new. In 1798 the president of Yale College, Timothy Dwight, declared that a conspiracy by the Illuminati was seeking "the overthrow of religion, government, and human society civil and domestic."

Dwight made explicit reference to the Order of the Illuminati, meaning those who had been enlightened, which had been founded in 1776 by a German law professor called Adam Weishaupt in Bavaria. The aim of this society was to oppose religious domination in society and create a space where free and critical speech was tolerated. Many of its rituals and social aspects were directly modelled on those of the Freemasons. The Illuminati eventually numbered around 2,000 members. But in 1785 the Bavarian government banned secret societies, raided the homes of Illuminati leaders, and Weishaupt fled.

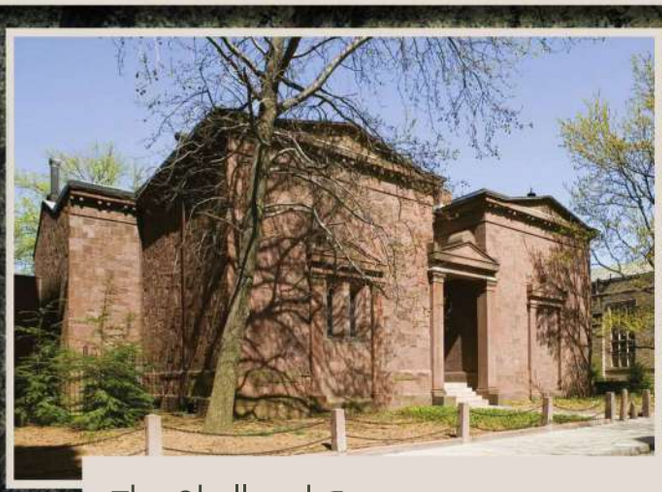
Earlier groups had claimed to be Illuminated by the truth and used similar names to the Illuminati, and some see this as evidence of a long-lasting and hidden secret society that operates to this day. The supposed Illuminati image of the 'all-seeing eye' can be found on the $1 bill in the United States.

The Rosicrucians *1614 – Present*

In 1614 a book called *Fama Fraternitatis Rosae Crucis* – The Story of the Brotherhood of the Rosy Cross – was published in Germany. It tells the story of how the tomb of a medieval monk was opened and an ancient text was found clutched in the dead man's miraculously undecayed hands. This grave book revealed how the monk had travelled widely in the east and learned esoteric knowledge before returning to Europe to found the order later known as the Rosicrucians.

More books delving into the acts and hidden wisdom of the Rosicrucians soon appeared. Many of these dealt with theological and alchemical theory and bolstered the imagined powers of the Rosicrucians. In Paris in 1622 two posters were put up that claimed to be written by the Rosicrucians and announced that they were active in the city. Many 17th century thinkers, in particular Protestants, defended what the Rosicrucians apparently stood for though few actually claimed membership.

During the Enlightenment those who adhered to Rosicrucian mysticism continued to publish tracts opposing the emergence of mechanistic science. Societies claiming descent from the Rosicrucians emerged in later centuries. Members of these Rosicrucian sects then formed further esoteric orders such as the Hermetic Order of the Golden Dawn, which included members like WB Yeats, Algernon Blackwood, and Aleister Crowley.



The Skull and Bones *1832 – Present*

Yale is one of the oldest colleges in the United States, being older than the country itself, and The Skull and Bones club is the oldest society at Yale. It is also known as the 'Brotherhood of Death' and 'Order 322' – a number that may refer to the year democracy in ancient Athens was overthrown.

Each year 15 junior members of the college are 'tapped' and elected as members of the club. As a secret society it is quite public, as for a time the names of those who made it into the exclusive club were published in national papers. What happens at meetings of the society however are never revealed. This has led some to hypothesise the club controlling many aspects of American life. Many famous American politicians have indeed been members of the society. Both presidents Bush were in the Skull and Bones, as was John Kerry, George W Bush's opponent in the 2004 election.

Perhaps the least troubling thing the society has been accused of is stealing the skulls of Martin van Buren and Geronimo. The club meets in an ominous and imposing structure known as The Tomb, as well as owning Deer Island for getaways.

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The Hellfire Club *c.1749 - 1766*

Beneath the hills of West Wycombe there extends a series of man-made caves dug into the chalk and flint that run for 200m. These were the creation of Francis Dashwood and are commonly known as the Hellfire Caves as this is where the Order of the Friars of St. Francis of Wycombe, better known as the Hellfire Club, met.

Dashwood was a bit of a bounder and rake and known to have tried seducing Tsarina Anne of Russia while he was pretending to be King Charles XII of Sweden. He also enjoyed a drink. It is perhaps unsurprising then that the meetings of the Hellfire Club were drunken affairs filled with practical jokes. At one event it is said a mock Satanic rite was performed and at the climax of the ritual a baboon dressed as the Devil was released, which caused the Earl of Sandwich to fall to his knees and beg 'Satan' for mercy.

Such tales about what the mad 'Monks of Medmenham' got up to were wildly popular. Alas the Hellfire Club's records were burned in the 18th century and so we shall never know the truth of what happened in the depths of their caves.

The Bullingdon Club *1780 - Present*

The Bullingdon Club at Oxford University was formed as a sporting group for the scions of wealthy families that attended the elite institution. In the 19th century cricket and horse-riding had mostly given way to dining and other, less refined sports. Their uniform of navy blue tailcoats with monogrammed brass buttons is made by the famed tailors Ede and Ravenscroft and costs several thousand pounds.

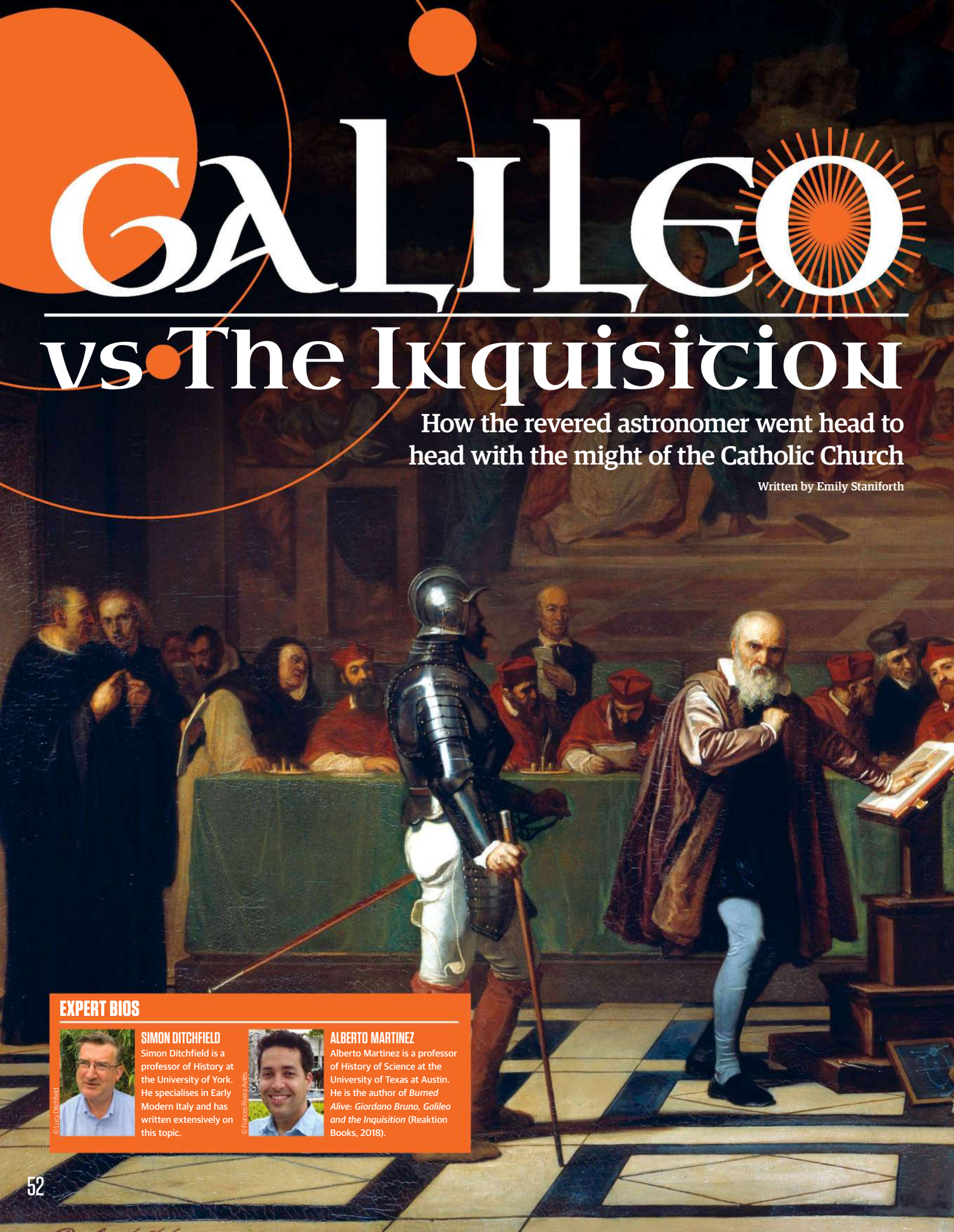
The club is not held in high regards by many in Oxford. This is due to a tendency for its members to hold raucous parties that often involve some level of destruction. When booking establishments for their meetings the Bullingdon Club generally uses a pseudonym as most places will not have them. Members also enjoy chanting "Buller, Buller!" as they smash bottles in streets.

Why would someone want to be a member of a club best known for vandalism? There are undoubted social benefits to membership. Kings Edward VII and Edward VIII were members, as were other members of the nobility. Perhaps most famously the club was the stomping ground of prime ministers David Cameron and Boris Johnson.

Galileo vs The Inquisition

How the revered astronomer went head to head with the might of the Catholic Church

Written by Emily Staniforth



EXPERT BIOS

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SIMON DITCHFIELD

Simon Ditchfield is a professor of History at the University of York. He specialises in Early Modern Italy and has written extensively on this topic.

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ALBERTO MARTINEZ

Alberto Martinez is a professor of History of Science at the University of Texas at Austin. He is the author of *Burned Alive: Giordano Bruno, Galileo and the Inquisition* (Reaktion Books, 2018).

Galileo di Vincenzo Bonaiuti de' Galilei was born in Pisa, then in the Duchy of Florence, in 1564. Commonly known as Galileo, he is credited with being one of the greatest scientific minds of the 16th and 17th centuries and is sometimes referred to as the 'father of modern science'. However, during Galileo's lifetime he would not have been referred to as a scientist. He was a polymath: a natural philosopher, mathematician and astronomer. Attending the University of Padua, initially to study medicine but later mathematics, Galileo honed his scientific knowledge before beginning to lecture and theorise for himself. In astronomy, he made advances that redefined the way we've understood the universe ever since. Although it is a common misconception that Galileo invented the telescope (it was actually invented in the Netherlands in 1608), he did utilise the new equipment to discover the four moons of Jupiter, the phases of Venus and that the Moon was covered in craters and mountains. Yet it wasn't any of these groundbreaking findings that he would have to defend when he came up against one of the most powerful institutions in the Italian states.

Founded in the 12th century, the Inquisition was a collection of Catholic

© Getty Images

organisations across Europe that operated with the aim of rooting out heresy and heretics across the continent.

The most infamous incarnation of the Inquisition was established in Spain in the 15th century and was known for its extreme and brutal methods. In the papal state of Rome, however, the Roman Inquisition saw a renewal in 1542, largely in response to the Counter-Reformation that was sweeping across Europe. In comparison to the Spanish Inquisition, the Roman branch was much more moderate in its pursuit of heretics, but this did not diminish its power or the fear it inspired.

"The Roman Inquisition was very powerful. It was totalitarian in as much as it prohibited Catholics from expressing certain thoughts, and from thinking them," says Alberto Martinez, a professor of History of Science at the University of Texas at Austin. "The Inquisition could imprison, threaten, torture and order the execution of impenitent heretics. They also banned and burned books."

> "A change in power inspired Galileo to reevaluate the threat the Inquisition posed"

Galileo found himself up against the Roman Inquisition in 1616 and it was his views on heliocentrism, also known as the Copernican theory of the universe, that, in the eyes of the Inquisition, were in danger of putting him at odds with the Catholic religion. In the 16th century, Polish astronomer and mathematician Nicolaus Copernicus had suggested that the Sun was at the centre of the universe and the stars and planets moved around it. However, at the time Copernicus began to put forward his theory, it was believed and accepted that the Ptolemaic geocentric system of the universe, in which the Earth was at the centre of the universe, was accurate. This geocentric model was compatible with the teachings of the Bible, and any deviation from this view could have been seen as dangerous and heretical by the Church.

Previously, the Inquisition had not seen Copernicanism as a threat, partly due to the fact that Copernicus himself was a member of the Church – he had held a position as a church canon in his native Poland. The preface to his defining work *De revolutionibus orbium coelestium* (*On the Revolutions of the Heavenly Spheres*), which he published in 1543, stated that the heliocentric theory he proposed was only a mathematical hypothesis rather than fact. He even dedicated the work to Pope Paul III, despite knowing that its contents could be seen as religiously controversial.

By the early 1600s, Galileo was a well-known figure in the world of astronomy and natural philosophy. His discoveries of the phases of Venus and his work on identifying sunspots, in his opinion, supported Copernicus' theory that the planets revolved around the Sun. While the Catholic Church had been happy to stay relatively silent on Copernicanism before, Galileo's popularisation and highly visible promotion of the theory began to cause ripples within the Inquisition. It claimed that the suggestion that the Earth travelled around the Sun contradicted the teachings of the Bible as God had created the Sun to provide light for the Earth in the *Book of Genesis*, and because it was implied in the *Book of Joshua* that the Sun is mobile. According to the Inquisition, these biblical teachings were called into question if the Earth revolved around the Sun. It is likely that Galileo was aware that his support for heliocentrism could possibly get him into trouble with the Inquisition, so he exercised caution by preempting any contact from it.

"We have to recognise that Galileo is a bit of a grandstander and he's not very good at getting on with people. He has quite a big opinion of himself and quite a high profile," explains Simon Ditchfield, a professor of History at the University of York. "But at the same time, he's not stupid. And so what he tried to do was explain [his position]."

In 1613, Galileo wrote to his friend and fellow mathematician Benedetto Castelli about reconciling religion and science. In 1614, he expanded this argument and penned his *Letter to the Grand Duchess Christina* in which he argued that a scientific examination of the universe and the Catholic religion and biblical word were compatible and could exist alongside one another in harmony. While the letter was addressed to the Grand Duchess of Tuscany, it was intended to be circulated as an essay for public consumption. It has been suggested that addressing the letter to a person of high status, like Grand Duchess Christina, would have helped increase the profile of the essay, while Galileo may also have been hoping for the support of her relatives – the powerful Medici family.

However, the Inquisition wasn't persuaded by Galileo's argument and, in March 1615, Pope Paul V began to discuss the astronomer's work with the Inquisitors. A year later, Inquisitor Cardinal Robert Bellarmine was instructed to warn Galileo that he was entering into dangerous waters. Bellarmine informed Galileo that he needed to immediately cease his discussions and belief in Copernicanism and stop spreading his heretical opinions. Galileo agreed to do so and, for a number of years, abided by his promise. It is

RIGHT A 1636 portrait of Galileo Galilei by Flemish painter Justus Sustermans

BELOW Galileo became famous for observing the sky and making discoveries using telescopes

BELOW-LEFT A portrait of Maffeo Barberini, later Pope Urban VIII, by Caravaggio

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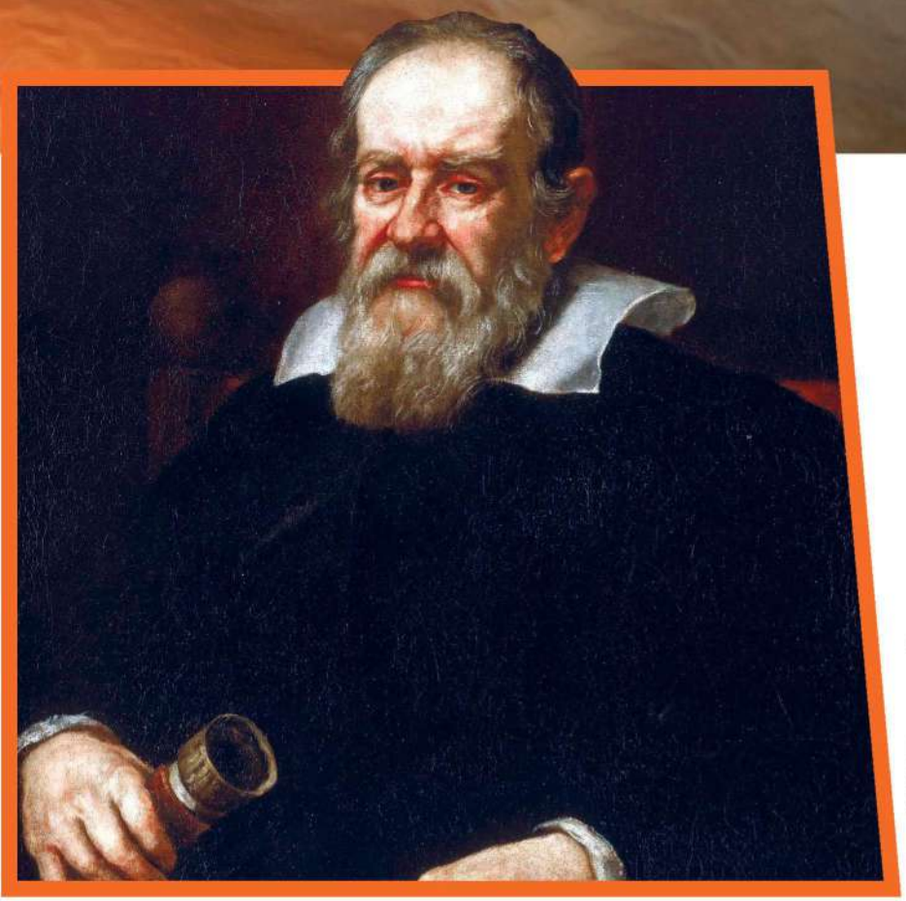

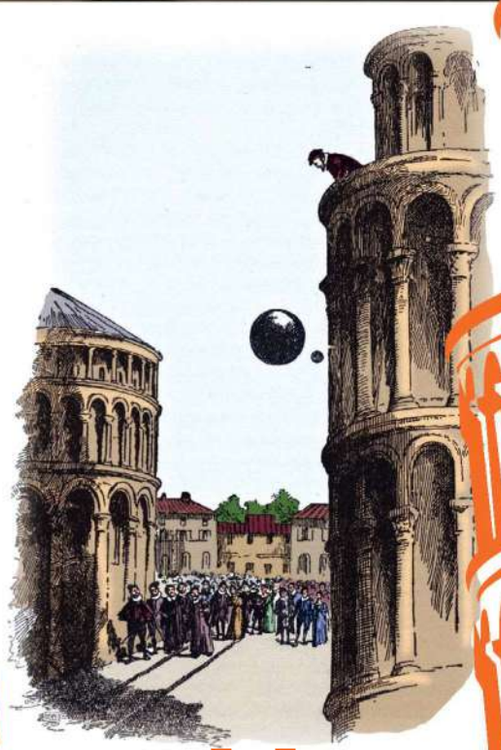

Galileo at the Leaning Tower of Pisa

How the groundbreaking genius may have used his hometown's most iconic landmark in his experiments

The city of Pisa in Tuscany is known for two things – the infamous Leaning Tower and for being the birthplace of Galileo. In one popular legend, both these icons were brought together to create a truly Pisan tale. It's said that Galileo was interested in determining the rate at which objects free fall and whether the rate was dependent upon the object's density. To test this in an experiment, Galileo supposedly decided to climb the Leaning Tower and, once at the top, he dropped objects of differing weights and sizes to the ground to test whether their weight impacted the rate at which they fell. He found that objects of the same material dropped at the same speed, regardless of their size, disproving Aristotle's theory of gravity that stated that objects would fall at different speeds in relation to their weight. This tale was recorded by one of Galileo's pupils, Vincenzo Viviani, after the astronomer's death, though most historians now believe that this event did not actually happen. It is possible, however, that Galileo had considered this idea as a thought experiment.

The Execution of Giordano Bruno

Galileo's Neapolitan counterpart did not fare so well against the Inquisition

"I'm fascinated by the case of Giordano Bruno," says Alberto Martinez, a professor of History of Science. "People nowadays say that he wasn't a scientist, yet his claims were more correct than those of Copernicus and Galileo, who both wrongly claimed that the universe was spherical, that the Sun is the centre of the universe, and that planets' motions are circular. Instead, Bruno rightly argued that the Sun is just a star, that it's not the centre of the universe, which isn't spherical, and that no motions are perfectly circular. The Inquisitions in Venice and Rome both imprisoned Bruno and interrogated him for many years. In Rome they threatened him with torture and finally burned him alive when he didn't retract his beliefs."

The case of Bruno, and his execution in 1600, may have had a profound effect on the outcome of Galileo's trial. While Bruno had also been in trouble with the Inquisition because of his religious views as well as his scientific ones, his punishment was particularly harsh. The Roman Inquisition, unlike its Spanish counterpart, was more moderate in its approach to putting a stop to heresy, and endeavoured to persuade and reprimand rather than punish. Cardinal Bellarmine, who would later deal with Galileo on behalf of the Inquisition in 1616, was a judge at Bruno's trial and had, along with others, condemned him to death. It is possible that the shocking extremity of Bruno's sentence inspired Bellarmine and other Inquisitors to act in a more restrained manner when dealing with Galileo years later.

no surprise that this encounter with Bellarmine would've been enough to persuade Galileo. Just 16 years earlier, in 1600, philosopher Giordano Bruno had been burned alive in Rome for his 'heretical' cosmological views. As a result of this initial interaction with Galileo, the decision was made by the Inquisition to restrict access to Copernicus' work. The Sacred Congregation of the Index, an institution established in Rome in 1571, placed *On the Revolutions of the Heavenly Spheres* on to the Index of books that were banned on the grounds of heresy.

It was not until 1632 that Galileo and the Inquisition clashed once again. Although he had agreed to no longer promote and discuss the theory of heliocentrism, a change in power inspired Galileo to reevaluate the threat the Inquisition posed and the extent to which he could get away with disregarding its instructions. In 1623 Maffeo Barberini became Pope Urban VIII and, as a fellow Florentine, he was familiar with and knew Galileo.

"He's met Galileo on several occasions; they get on well, they're both very cultured and the pope fancies himself as a Latin poet," says Ditchfield. "Galileo, although he's very good at irritating people, is also quite good at playing the courtier so he thinks his luck is in. One of the reasons why they say he goes ahead with writing and publishing the *Dialogue Concerning the Two Chief World Systems* is that he feels that he has a friend as pope and there won't be any problem." However, Galileo underestimated the extent to which his connection with the pope would protect him from the Inquisition.

When Galileo set about getting *The Dialogue Concerning the Two Chief World Systems* approved for publication in 1632, he presented it to the Florentine branch of the Inquisition. The *Dialogue* describes a meeting between three fictional characters who discuss the possible workings of the universe. After adding a precept that clearly stated that the work, which argues for the heliocentric model over the traditional geocentric alternative, was a purely theoretical exercise, the *Dialogue* was cleared to be published by the Florentines.

However, Pope Urban was less than impressed with Galileo, as he had conveniently failed to mention in his request for publication that he had already been warned by Bellarmine that he was not permitted to teach or hold Copernican beliefs. As a result of this mistake, or possible deception on Galileo's part, he was investigated by a commission established by Pope Urban and eventually summoned by the Inquisition.

"When [Galileo] was summoned by the Inquisition, again, he should possibly have tried to keep things out of court and apparently he was given some legal

ABOVE The trial of Galileo took place in Rome in 1633

BELOW During his trial, Galileo was imprisoned. He is depicted here drawing a model of the universe on the walls of his cell

BOTTOM The tomb of Galileo at the Basilica of Santa Croce

advice but chose to ignore it. He decided to clear his name by going to Rome and having a trial. And that's regarded as another mistake," explains Ditchfield. "I think he was convinced of his own self-righteousness and his own power of persuasion. I think that for him the idea that he could persuade the pope to say 'leave the Bible to the Bible and leave natural philosophy to the philosophers' was still very much on his mind."

Although it could be argued that Bellarmine's warning in 1616 was ambiguous in its exact conditions and Galileo had not reneged on it by putting forward a theoretical discussion of the systems of the universe, the pope and the Inquisition were set on challenging the now-ageing astronomer. When Galileo arrived in Rome in 1633, he was imprisoned for the duration of his Inquisitorial trial. Historians have been able to study the trial, which took place over three sessions between 12 April to 22 June 1633, in extraordinary depth because the records of the trial have survived intact.

Upon facing the Inquisition, Martinez says: "[Galileo] defended his theory of Earth's motion by putting it in the voice of a character in a fictional dialogue. Still, when Inquisitors interrogated him, he denied believing in the Earth's motion and pretended that he'd meant to prove that it does not move. He even offered to expand his book to stress that it doesn't move."

Despite his protestations and denials, Galileo eventually admitted that some of his arguments for the Copernican system may have been put across too strongly in the *Dialogue*. It was this admittance that sealed his conviction on vehement suspicion of heresy. Once found guilty of this offence, he was made to recant his heretical views and, as a result, also recant a lot of the work he had completed during his lifetime. In his recantation Galileo is said to have stated: "I swear that in the future I will never again say or assert, verbally or in writing, anything that might furnish occasion for a similar suspicion regarding me."

Aged 70 at the time of the trial, Galileo pleaded with the Inquisition for a lenient sentence that took into account his age and declining health. Luckily, he avoided the same punishment as his unfortunate predecessor, Bruno, and instead was put under house arrest for the remainder of his life. His *Dialogue* was added to the Index, alongside the work of Copernicus, and remained on the list of prohibited books until it was finally removed in the 19th century.

The condemnation of Galileo was hugely significant in the cultural and academic spheres of the Italian states, and wider Europe, at the time. "The trials of Bruno and Galileo both derailed the Italian Renaissance," says Martinez. "Some astronomers, writers and philosophers in Italy became afraid to speak openly. Even in France, René Descartes abstained from soon publishing his ideas. Still, more broadly the censorship and Inquisitors' opposition did inspire some people, especially in Protestant lands, to support and develop the new and controversial ideas about Earth and the universe. Martyrs inspire followers, even in science."

Though Galileo's work was censored by the Inquisition and he was locked away in his final years, he continued to write and publish, though not about models of the universe and not in the Italian states. His final work was published in Leiden in the Netherlands in 1638 as the great astronomer, who had made his name and career looking through his telescope at the sky, started to go blind. He died in 1642, still under house arrest at his home in the hills around Florence. His body lies in the Florentine Basilica of Santa Croce, where he is surrounded by other famed Italian artists and intellectuals like Michelangelo and Machiavelli. Though it was controversial due to his conviction, he was afforded an impressive and beautiful tomb monument after an intervention by an influential member of the Medici family.

> "The condemnation of Galileo was pivotal in the cultural and academic spheres of the Italian states"

In the century after his death, Galileo became an icon of the Italian intellectual sphere. "He becomes a bit of a hero, then progressively more and more a hero," explains Ditchfield. In 1737, Galileo's body was briefly exhumed and his finger was taken as a secular relic, now housed in the Galileo Museum in Florence. "It's only really in 1893, when Pope Leo XIII says, actually, the Bible doesn't have anything to say about science. But that's 1893, that's quite a long time," says Ditchfield. In 1992, the Vatican admitted to being wrong in its condemnation of Galileo and today he is revered as one of the greatest scientific minds in history.

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GOING UNDER GROUND

The hidden world under London revealed thanks to the London Transport Museum

Written by Jonathan Gordon

BENEATH THE BRIGHT LIGHTS

PICCADILLY CIRCUS

1906 – PRESENT

As the station for one of the most visited landmarks in London, Piccadilly Circus is a major hub for the Underground network. It averaged around 40 million passengers annually in the years prior to the COVID pandemic. During WWII its disused tunnels acted as a shelter not only to the public, but to art from the London Museum and Tate Gallery. Modernised in the 1920s, the station has been opened up in unique ways to visitors who can see some of the Grade II listed building's secret doors, passages and original features. The entire story of London's Underground and how it has developed over the years can be found here.

LEFT A station entrance as it looked in 1965

UNDER TRAFALGAR SQUARE

ABOVE Planning committee leader Shelagh Roberts of the Greater London Council opens Charing Cross Underground station in 1979

CHARING CROSS STATION

1864 – PRESENT

Charing Cross station started its life serving London commuters in 1864 as a railway station before becoming an early stop for the District Line as it emerged from 1870. However, the station as we know it today has gone through a lot of changes, not least of which is its name. The London Underground portions of the station were originally Trafalgar Square, named after the famous public space above, which opened in 1906 and Strand, which opened in 1907. These merged as Charing Cross, but also broke off as Embankment. However, the historically interesting bit is at Charing Cross where you could once have boarded the Jubilee Line.

The Jubilee Line stop at Charing Cross was closed in 1999, but you can still visit it and it's used frequently as a shooting location for films and TV. Any recent movie you can think of with a London Underground chase sequence, fight or other action scene, there's a good chance it was shot here, from *Skyfall* to *Killing Eve*. While some of the station has therefore been kept up to date for filming, other portions are a time capsule of the late 20th century.

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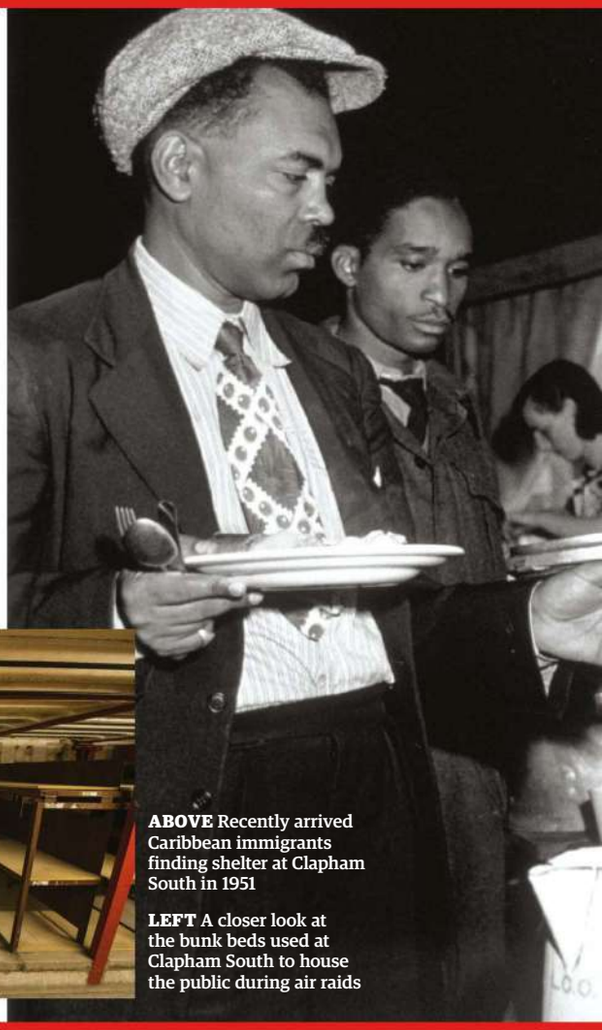
SHELTER FROM THE STORM

CLAPHAM SOUTH SHELTER

1944 – 1956

As Britain and London in particular was the target of regular bombing from Nazi forces during World War II, bomb shelters like the one at Clapham South were common and frequently used. A number of shelters were commissioned as a result. This is one of eight deep-level shelters and is about 11 stories under the streets of London. It has over 1.5km of passageways and was designed to shelter about 8,000 people, as were the other deep-level shelters. The Blitz had ended by the time they were finished, however this shelter along with a few others were used from 1944 during the V1 and V2 rocket attacks.

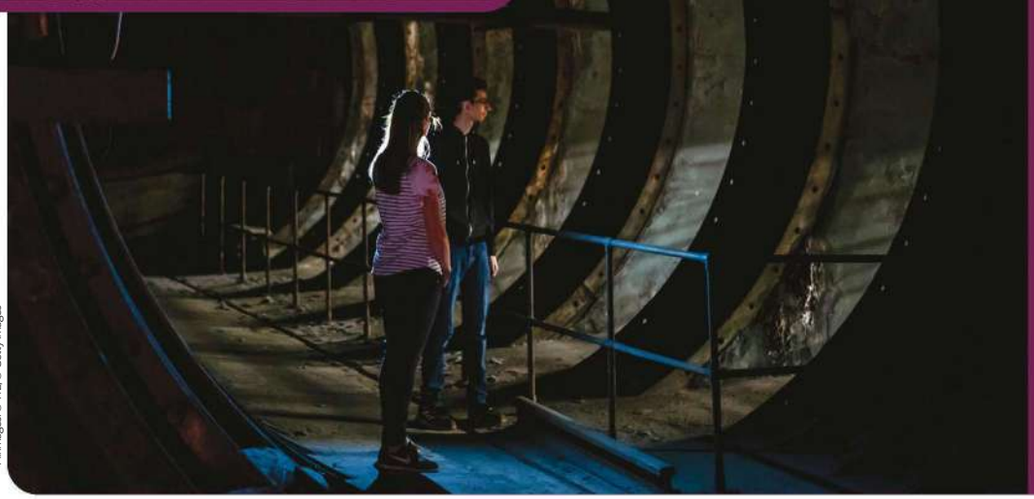
Visitors to the shelter today can see the 400 metre-long tunnels packed full of bunk beds that continued to find a use after the war. It was used to shelter migrants who disembarked the Empire Windrush in 1948 before they found new accommodation and hosted visitors to the Festival of Britain in 1951. The shelters were all closed to the public, however, after a fire at the Goodge Street shelter. The spaces continued to be used as storage and for other purposes.



ABOVE Recently arrived Caribbean immigrants finding shelter at Clapham South in 1951

LEFT A closer look at the bunk beds used at Clapham South to house the public during air raids

LEFT Shepherd's Bush station as it looked back in 1900 when it opened



SUBURBS TO CITY

SHEPHERD'S BUSH STATION

1900 – PRESENT

As the western hub of the Central London Railway, the precursor to today's Central Line on the London Underground, Shepherd's Bush has been a pivotal station for commuters since its inception. Connecting the western suburbs with the West End, it even had a ticket that could also be used on the city's tram network. Many of its tunnels have been closed to the public, however, with renovation and modernisation making them obsolete. It also had innovative cooling tunnels to keep the line comfortable for travellers. All of these can be explored with LTM's tours if you get a chance to check them out.

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THE OLDEST TERMINAL

EUSTON STATION

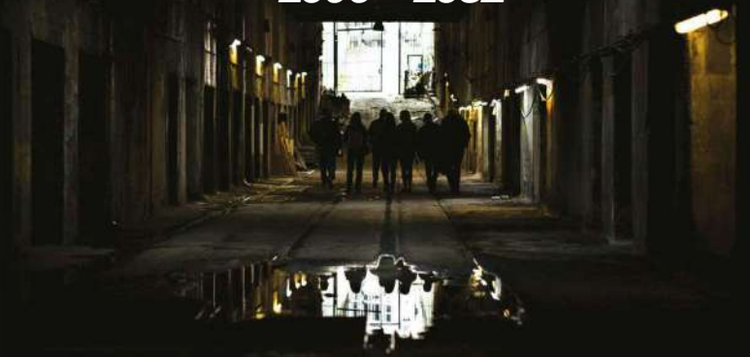
1907 – PRESENT

The history of train travel at Euston dates back to the original 1837 railway, which made it the first mainline station in the capital, originally connecting it to Birmingham. Much has changed since then, with the addition of an Underground station and then that station also moving its entrance location. The old building, designed by architect Leslie Green as many were, is now a time capsule for the 1960s when it was replaced by a new building that tied it to the new Victoria line. Vintage posters and signage abound in these tunnels and walkways.

TRAM TIMES

KINGSWAY TRAM SUBWAY

1906 – 1952



One mode of transport you don't see around the majority of London today, yet is pretty common in a lot of other major cities around the world, is a tram. However, it wasn't always this way and in typical London style, it had a tram that went underground and a double-decker tram as well. The service ran in the north and south of the city with the Kingsway Tram Subway acting as the underground link between the two networks. Ultimately the popularity of driving cars or taking a bus through London proved to be more popular than this network, and it was closed in 1952.

Most of the network's remnants have disappeared in the intervening decades, but some spots like the Kingsway Tram Subway remain in remarkable condition. Any visitor to the site today will see just how substantial the infrastructure of the network was as well as being able to see some old tram maps for the network, which are similar to those for the Underground.

ABOVE A photo of the last tram to run between Southampton Row and Embankment

LEFT Aldwych station was used as a staging area for an emergency services exercise in 2012 ahead of the London Olympics

ABOVE As well as being used as a bomb shelter during the Blitz, Aldwych hosted a concert in May 1944

TIME TUNNEL

ALDWYCH STATION
1907 – 1994

Much like other abandoned Underground stations in London, this one has found a second life as a filming location for film and TV (such as *Darkest Hour* and *Sherlock*). In its 87 years of operation, however, it was less successful, averaging only a few hundred passengers a day. That it was only a six-minute walk from the next station stop at Holborn on the same line may have played a part in that. Like many stations it was also a bomb shelter during WWII, protecting up to 2,500 people, with the station closed from 1940 to serve that sole purpose.

As a tourist attraction managed by London Transport Museum, Aldwych is one of the most comprehensive sites for exploring different elements of the fascinating history of London's transport network. This includes the ticket hall, original lifts, platforms, tunnels and walkways that connect it all together. In between you'll find old advertising on the hoardings and educational displays provided by the museum.

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RUN UNTIL 27 AUGUST 2023. VISIT **WWW.LTMUSEUM.CO.UK/HIDDEN-LONDON** FOR TICKETS, TOUR AVAILABILITY AND DATES

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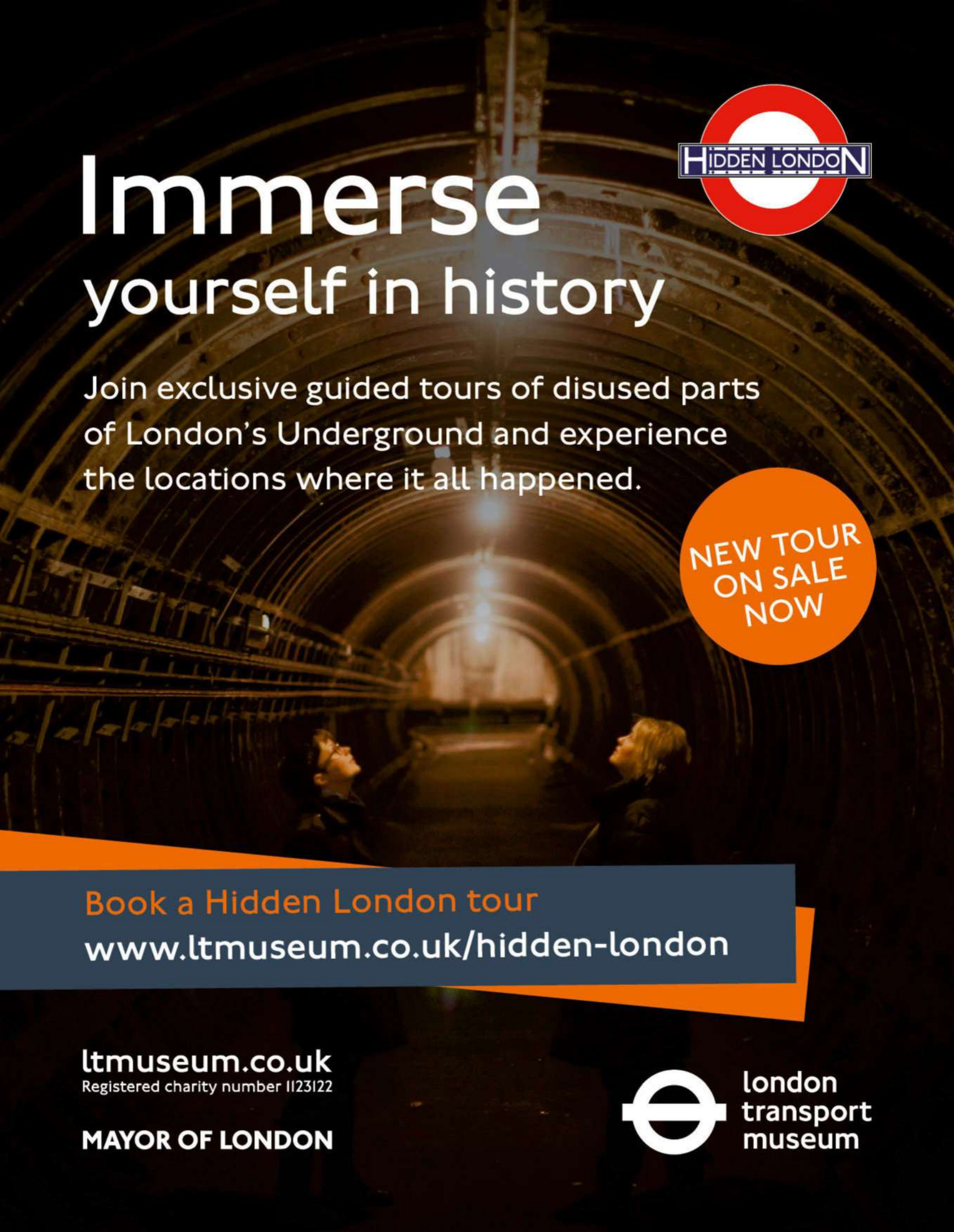
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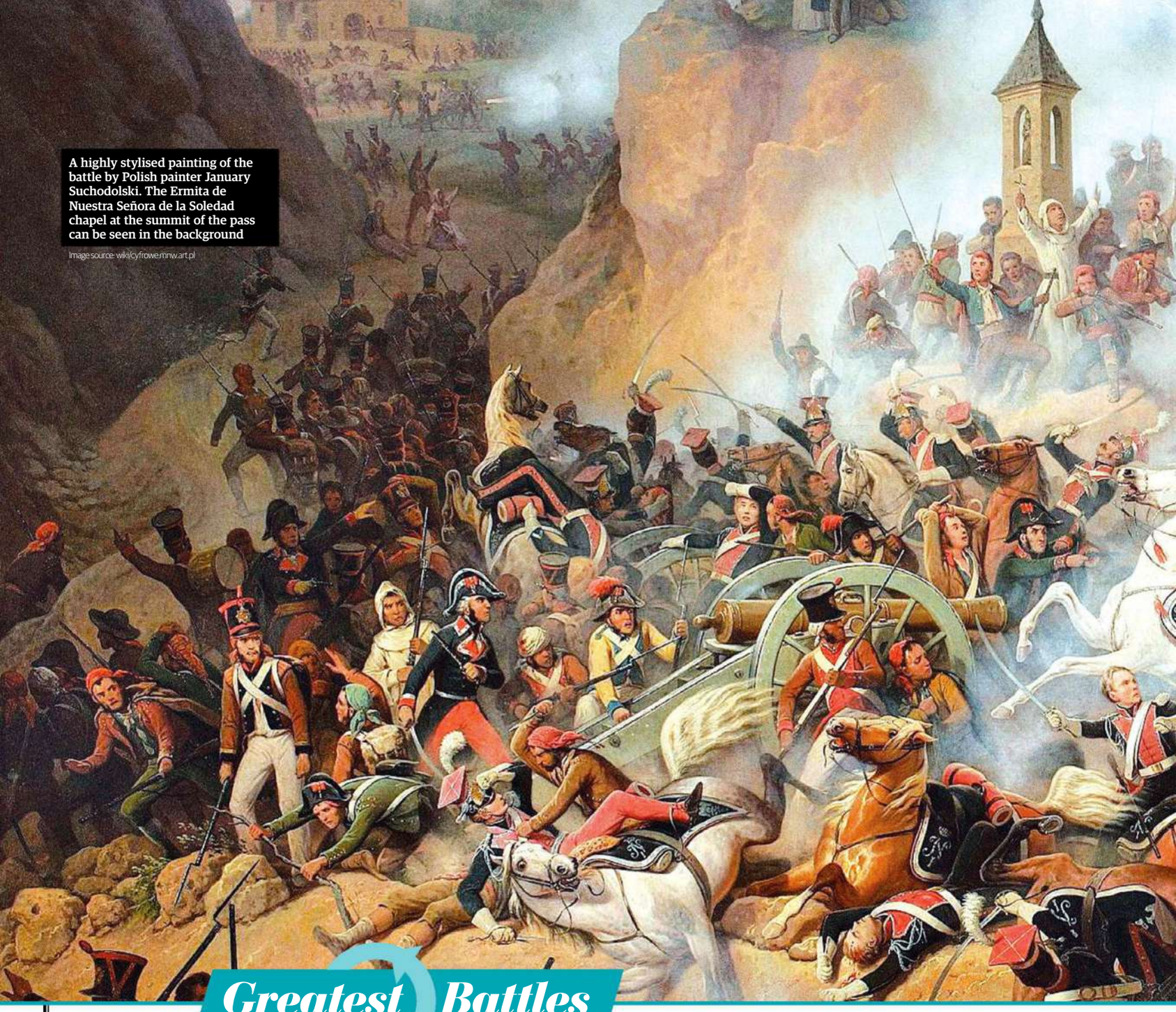


A highly stylised painting of the battle by Polish painter January Suchodolski. The Ermita de Nuestra Señora de la Soledad chapel at the summit of the pass can be seen in the background

Image source: wiki/cyfrowe.mnw.art.pl

Greatest Battles

BATTLE OF SOMOSIERRA

SOMOSIERRA PASS, SEGOVIA, SPAIN , 30 NOVEMBER 1808

Written by Alex Zakrzewski

In June 1808, Napoleon Bonaparte installed his brother Joseph on the Spanish throne as a way of securing French control of the Iberian Peninsula. It turned out to have the opposite effect. The Spanish people disliked their feckless Bourbon monarchs, but they absolutely hated the meddlesome French. Within weeks, violent revolts sprang up across the country, and the overextended French forces found themselves isolated in hostile territory. In August, having resided in Madrid for only ten days, Joseph was forced to flee to the French border. To make matters worse, during this time a British expeditionary force under the command of Sir Arthur Wellesley landed in Portugal, beginning the six-year Peninsular War.

When Napoleon learned of what had transpired in Spain, he was irate and berated his generals

for their incompetence. "I realise I must go there myself to get the machine working again," he announced, and on 4 November 1808 he crossed the Pyrenees with an army of 130,000 men, mostly veterans of previous campaigns. His arrival in Spain immediately tipped the scales back in favour of the French. On 10 November he won a crushing victory at the Battle of Gamonel, and two weeks later the French defeated another Spanish army at Tudela. What was left of the shattered Spanish forces retreated south towards Madrid with Napoleon himself in vigorous pursuit at the head of a 45,000-strong vanguard.

MOUNTAIN PASSES

Napoleon now faced another obstacle – one that he could not simply outmanoeuvre on the battlefield. The Sierra de Guadarrama mountains run roughly 80 kilometres (50 miles) across central Spain, shielding Madrid from an attack from the north. In 1808, there were two main passes the French could have taken: one near the town of Guadarrama northwest of Madrid, and another that ran through the sleepy mountain village of Somosierra almost directly north of the capital. Napoleon chose the latter, because it was the quickest route and located along the main road south from Burgos, where he was regrouping his army.

In Madrid, Spanish general Benito San Juan desperately rallied together what forces he could to defend the mountain passes, which he correctly reasoned was his best hope of defending the capital. To that end, he sent 9,000 men to Guadarrama and another 7,500 to Somosierra. Another token force was posted north of the mountains to harry the French advance.

The Somosierra Pass was the perfect place for a spirited defence. For the first few kilometres the mountain road ascended gently over largely open ground, until it reached a mountain river called the Duratón. It then steepened sharply, eventually climbing to a height of 1,430 metres (4,700 feet). On either side of the road, the slopes were dotted by a series of rocky spurs and ridges, as well as trees and vegetation, which made them difficult but not impossible to traverse. At the summit, there stood the ancient Ermita de Nuestra Señora de la Soledad chapel. From there the road levelled off before beginning a gradual descent through Somosierra.

San Juan positioned three batteries, of two guns each, along the road at intervals of roughly 550

metres (600 yards). He placed the first battery at a stone bridge across the Duratón. At the summit, where the road widened and levelled, he had improvised breastworks constructed, behind which he positioned ten guns and 2,000 of his men. He placed the rest of his forces on the rough slopes on either side of the road, where the difficult terrain put them in a good position to repulse an attack.

FRENCH ATTACK

At about 9am on the foggy morning of 30 November 1808, Napoleon ordered General François Ruffin's division to seize the pass in a three-pronged attack. While the 96th Line Infantry Regiment advanced up the pass along the road, the 24th Line Infantry and Ninth Light Infantry Regiments were ordered to climb the rocky slopes on either side and cover the flanks. They were to be supported by a number of horse-drawn artillery pieces. However, such was the thickness of the fog that the French were not sure how many Spanish awaited them or where exactly they were positioned.

At first the French infantry seemed to make good progress, but when the 96th reached the stone bridge they were suddenly swept by cannon fire from the first Spanish battery. Up on the slopes, the other two regiments were similarly stalled by withering volleys of musket fire from the well-placed Spanish defenders. At the same time, the French artillery proved unable to keep up in the rough terrain and could not support the attack.

ACHIEVING THE 'IMPOSSIBLE'

By 11am the French attack had stalled completely. However, it was around this time that the fog finally began to lift, and Napoleon ordered one of his aides to reconnoitre the Spanish positions and ascertain what exactly was going on.

When the aide saw the Spanish batteries and the narrowness of the road they guarded, he returned to report to the emperor that it was impossible to seize the pass through a frontal assault. "Impossible? Impossible? I do not know this word," Napoleon angrily exclaimed. "What? My guard halted by a band of armed peasants!" He turned to his cavalry escort, which that day happened to be the Third Squadron of the Chevau-Légers Polonais (Polish Light Horse) of the Imperial Guard, and ordered them to attack.

It is unclear what exactly Napoleon meant by his order to attack. That is to say, whether he intended for the Poles to just take the first battery and open the road, or for them to storm the entire pass. Either way, the squadron's commander, Colonel Jan Kozietulski, was not about to question an order from Napoleon. He immediately drew his sabre and loudly bellowed, "Forward you sons of dogs, the emperor is watching you!" Behind him, the roughly 125 officers and men of the Third Squadron drew their sabres and followed him up the road.

THE CHARGE BEGINS

The squadron advanced at a trot, then a canter, and finally, when they were within sight of the guns, they broke into a gallop. Such was the narrowness of the road that the Poles were forced to ride four abreast in a long column – a cumbersome formation that made it difficult to pick up speed and manoeuvre. The Spanish waited until they were a few hundred metres away then opened fire with a devastating salvo that smashed the head of the column. Horses and riders tumbled to the ground, but the Poles did not stop. They surged through the battery, silencing the guns and sending the bewildered gunners fleeing up the road in terror.

By taking the first battery, the Poles had most likely fulfilled their objective and probably could have stopped and waited for Ruffin's infantry to take over. Instead they spurred their horses on and continued up the road towards the second battery. The further they got, the more intense the Spanish fire became, not just from the batteries but from the infantry on the slopes, who turned to unleash a deadly crossfire. Shortly after taking the first battery, Kozietulski's horse was killed and he was thrown to the ground, his leg badly bruised but otherwise unhurt. Command passed to Captain Dziewanowski, who led the squadron crashing through the second battery, once again silencing the guns and cutting down their crews.

MOUNTAIN MAELSTROM

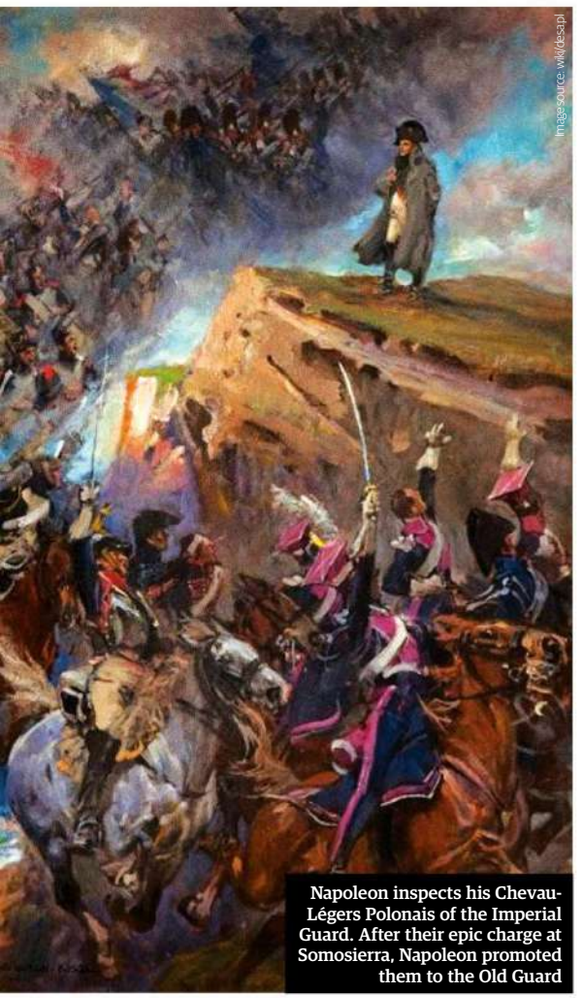
Yet again the Poles did not stop but continued on to the third battery. In truth, they had probably come too far at this point to turn back even if they wanted to. Any loss of forward momentum would have only intensified the maelstrom of bursting shells and whistling bullets they now faced. Men and horses everywhere screamed in pain and terror, and they crashed to the ground with crippling force. Those that followed behind did their best to avoid trampling their comrades, but by now most riders had lost control of their maddened, frothing mounts, many of which were grievously wounded and galloping solely out of fear, adrenaline and an instinct to follow the herd.

As they approached the third battery, Dziewanowski was shot off his horse and left badly bleeding by the side of the road. Command passed once again, this time to Captain Krasinski, who was also dismounted shortly after, though he was miraculously unhurt and was able to make his way back down the road on foot. He passed through a charnel ground of dead and dying men and horses, many badly mangled by the point-blank salvos of shrapnel and grapeshot. Meanwhile, command of the charge passed for the third and final time to Lieutenant Niegolewski. He led the remainder of the squadron through the third battery and on towards the summit, where ten guns and thousands of Spanish defenders awaited them.

However, the Poles had one important factor working in their favour. The lingering fog had combined with the dense pall of cannon smoke to severely obscure visibility along the road. As a result, many of the Spanish troops could not see just how few in number the Poles actually were. Convinced that an enormous force of French cavalry was thundering towards them, they began abandoning their positions and retreating towards the summit. As a result, by the time the Poles reached the final battery, what should have been San Juan's strongest position and the attackers'

The Chevau-Légers Polonais charge into battle at Wagram (1809). The two-day clash was a bloodbath, and the regiment suffered heavy casualties but again distinguished itself in the French victory

Image source: Wikiagraart.pl



Napoleon inspects his Chevau-Légers Polonais of the Imperial Guard. After their epic charge at Somosierra, Napoleon promoted them to the Old Guard

deadliest obstacle had devolved into a chaotic mob of panic-stricken troops fleeing in all directions.

THE SUMMIT IS REACHED

Finally on open and level ground, the attackers fanned out in all directions, hacking and slashing furiously at the fleeing enemy. After their hellish experience in the pass, they were just as crazed as their horses and eager to exact revenge. But by now their numbers had been so severely reduced that a shocked Niegolewski paused to ask Sergeant Sokolowski where the rest of the squadron was. "All dead, sir!" was the sobering response. It was not long before the fleeing Spanish also noticed just how few of the attackers were left. They regained their resolve and fell upon the outnumbered Poles from all sides. Niegolewski's horse was killed under him and he fell to the ground, pinned beneath its weight. He was shot twice, bayonetted nine times and robbed of anything of value, before his attackers finally left him for dead.

For a moment, it seemed as if the tide of battle had turned and that the Poles' costly heroics had been in vain. But just when it appeared that the Third Squadron was on the verge of annihilation, there arose from the distance a familiar beating of drums and chorus of "Vive L'Empereur". It grew louder and louder until finally General Ruffin's

FRANCE

NAPOLEON BONAPARTE

The French emperor arrived at Somosierra with only this final force to overcome before taking on Madrid, although the Peninsula War would continue for several more years before it would be concluded. Following this battle, Napoleon didn't take direct command of a battle for almost six months, returning to the front at the Battle of Teugen-Hausen.

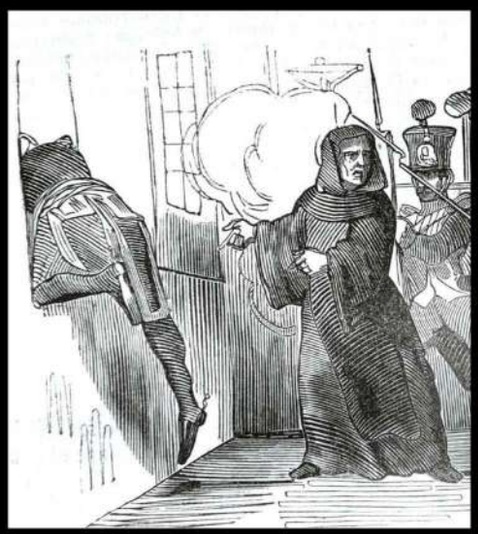
ANDRZEJ NIEGOLEWSKI

Having worked as part of the reconnaissance for the battle, Niegolewski joined the charge of the Polish cavalry and was the last officer available as they reached the last battery, losing his horse and breaking his leg in the attempt. He was surrounded by the Spanish and wounded, but survived. He was immediately awarded the Cross of the Legion of Honour.

JAN KOZIETULSKI

The famous cavalry charge of Somosierra was led by Kozietulski as one of the Polish commanders in the field that day. He was celebrated for the action and was among 18 Poles who were awarded the French Legion of Honour following the encounter. He continued to serve in the military following the war and was made a baron of the empire in 1811.

SPAIN



BENITO DE SAN JUAN

Having cobbled together a militia force to stand against the French coalition, San Juan had 12,000 men at his command, but had to break them up into smaller forces to defend the approaches to Madrid. He survived the battle, but his men ultimately turned against him in January 1809. He was shot three times as he attempted to flee through a window.

FERDINAND VII OF SPAIN

The forced abdication of Ferdinand VII by Napoleon, who handed the throne to his brother Joseph Bonaparte, was the event that started the Peninsula War. Many in power accepted the change, but popular opinion was against French rule, starting with a series of regional juntas. Ferdinand was restored to the throne at the conclusion of the war.

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Image source: wiki/gallerix.ru

With the path to the Spanish capital clear, Napoleon Bonaparte accepted the city's surrender on 4 December 1808

men began pouring out of the smoke and fog. Their arrival broke what will to fight was left in the Spanish, and they fled in disorder.

Accompanying Ruffin's men was Napoleon himself. He spotted the horribly wounded Niegolewski leaning against one of the captured cannons, covered in blood and barely clinging to life. The emperor was so moved that he climbed down from his horse and thanked him warmly for his bravery and sacrifice. He then removed the Legion d'Honneur from his own coat and pinned it on Niegolewski.

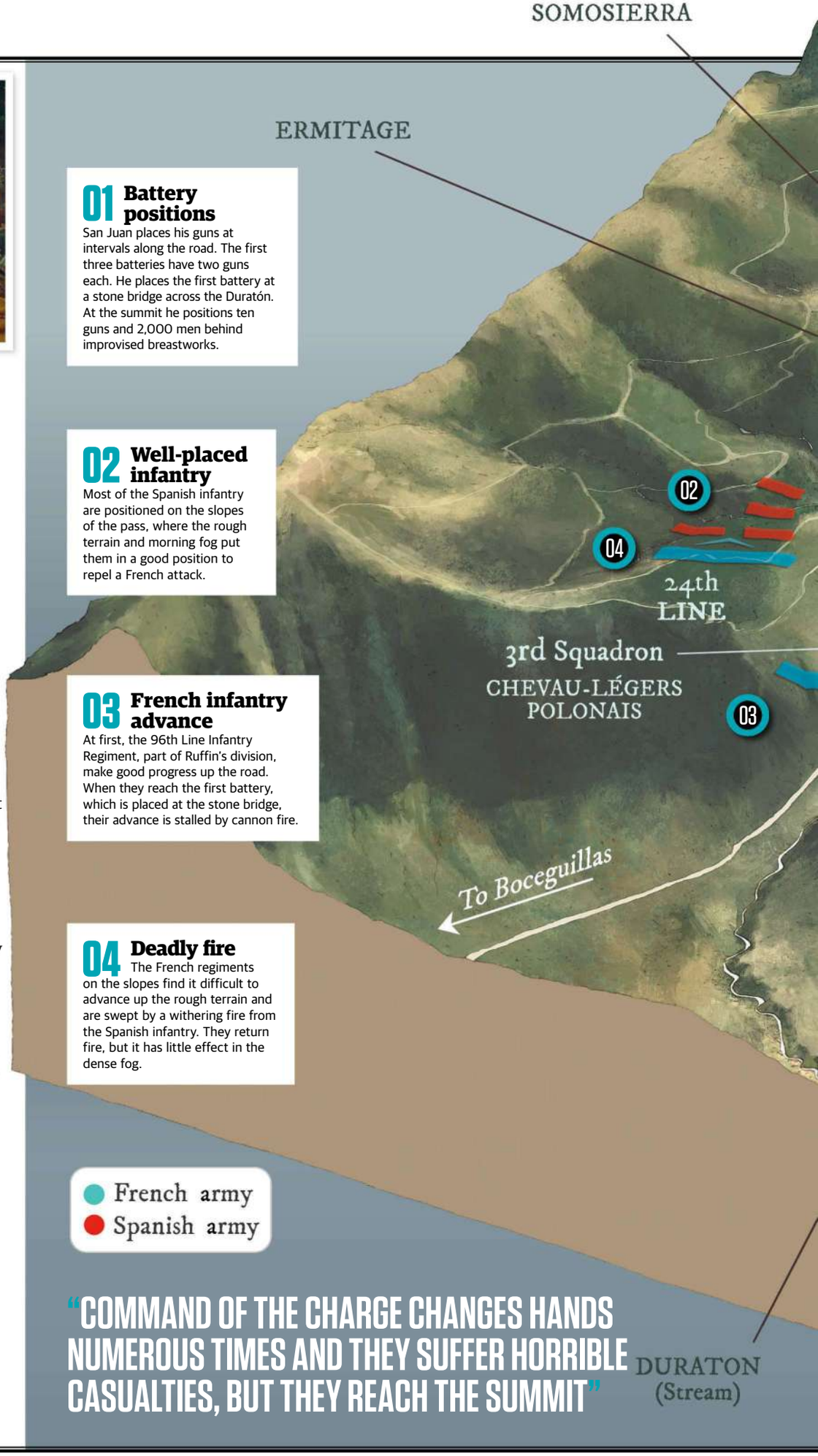
AFTERMATH

The charge had lasted seven minutes. In that time, the Poles had captured 16 guns and ten standards. More importantly, they had opened the road to Madrid. But they had paid a horrible price. Only 26 officers and men answered the roll call that evening. Few, if any, were completely unscathed. Many of the wounded eventually succumbed to their injuries, including Captain Dziewanowski.

Incredibly, Lieutenant Niegolewski recovered from his wounds and went on to see further service in Spain, Austria, Russia and France, before eventually returning to Poland. He was not the only member of the squadron to be honoured by the emperor. In total, 16 officers and troopers received the Legion d'Honneur for their gallantry. The day after the charge, after personally inspecting the entire regiment, Napoleon respectfully removed his hat and declared, "You are worthy of my Old Guard! Honour to the bravest of the brave!"

The overall number of Spanish losses at Somosierra is unknown. The French pursued San Juan's retreating men well into the afternoon, taking around 3,000 prisoners. The number of killed and wounded was probably relatively light given the overall brevity of the engagement. Arguably the last casualty was General San Juan, who was lynched by his own mutinous men.

Just four days after the battle, Madrid surrendered to Napoleon without a fight, and he reinstalled his brother on the Spanish throne. He spent a few more months mopping up Spanish resistance, then returned to France and turned his attention to a resurgent Austria. He took with him his Chevau-Légers Polonais of the Old Guard.


SOMOSIERRA
ERMITAGE
01 Battery positions
San Juan places his guns at intervals along the road. The first three batteries have two guns each. He places the first battery at a stone bridge across the Duratón. At the summit he positions ten guns and 2,000 men behind improvised breastworks.
02 Well-placed infantry
Most of the Spanish infantry are positioned on the slopes of the pass, where the rough terrain and morning fog put them in a good position to repel a French attack.
02
04
24th LINE
3rd Squadron
CHEVAU-LÉGERS POLONAIS
03
03 French infantry advance
At first, the 96th Line Infantry Regiment, part of Ruffin's division, make good progress up the road. When they reach the first battery, which is placed at the stone bridge, their advance is stalled by cannon fire.
To Boceguillas
04 Deadly fire
The French regiments on the slopes find it difficult to advance up the rough terrain and are swept by a withering fire from the Spanish infantry. They return fire, but it has little effect in the dense fog.
French army
Spanish army
"COMMAND OF THE CHARGE CHANGES HANDS NUMEROUS TIMES AND THEY SUFFER HORRIBLE CASUALTIES, BUT THEY REACH THE SUMMIT"
DURATON (Stream)

05 Napoleon's impatience

Furious at the lack of progress, Napoleon orders his cavalry escort, the Third Squadron of Chevau-Légers Polonais, to attack the first Spanish battery and open the road for Ruffin's infantry.

06 The charge continues

After taking the first battery, the Poles continue up the road. They face brutal fire from both the Spanish cannon and the infantry on the slopes. Command of the charge changes hands numerous times and they suffer horrible casualties, but they reach the summit.

07 The summit

Once at the summit, the Poles face a fierce Spanish counterattack. Luckily, Ruffin's infantry, accompanied by Napoleon himself, are not far behind. Their arrival puts the Spanish to flight. The road to Madrid is opened, and the city falls to the French four days later.

The commander of the Chevau-Légers Polonais, Count Wincenty Krasinski, was not present the day of the battle, but he went to great lengths to make it seem like he was. This painting by French artist Émile Jean-Horace Vernet depicts him at the summit of the pass following the charge

Image source: wiki/wohlektury.pl

Map by Rocio Espin

What If...

GUTENBERG'S PRINTING PRESS DID NOT SUCCEED?

How reform could have been stifled and the empowerment of literacy controlled by the elites of Church and State

Interview by David J. Williamson

INTERVIEW WITH

© John Man

JOHN MAN

Man is the author of *The Gutenberg Revolution*, the third great advance in communication after the development of writing and the invention of the alphabet, the subject of his *Alpha Beta*. His current speciality is the Mongol Empire. *Genghis Khan: Life, Death And Resurrection* is a bestseller in 21 languages. He has just translated *The Mongol Khan*, a Mongolian spectacular opening in London's Coliseum in November 2023.

The world of the 15th century had become a powder keg of ideas, commerce, invention and renaissance in the arts. The old world was being left behind as a new, more hopeful and brighter future dawned. The printing press of Johannes Gutenberg brought with it the ability to print books and pamphlets at a speed and in quantities never seen before. Information and ideas could circulate through Europe, gathering pace as they went. Gutenberg's inventiveness brought together the right elements, in the right place, at the right time. But if that moment had never happened, the world could have remained trapped in time.

What might have stopped Gutenberg developing his invention?

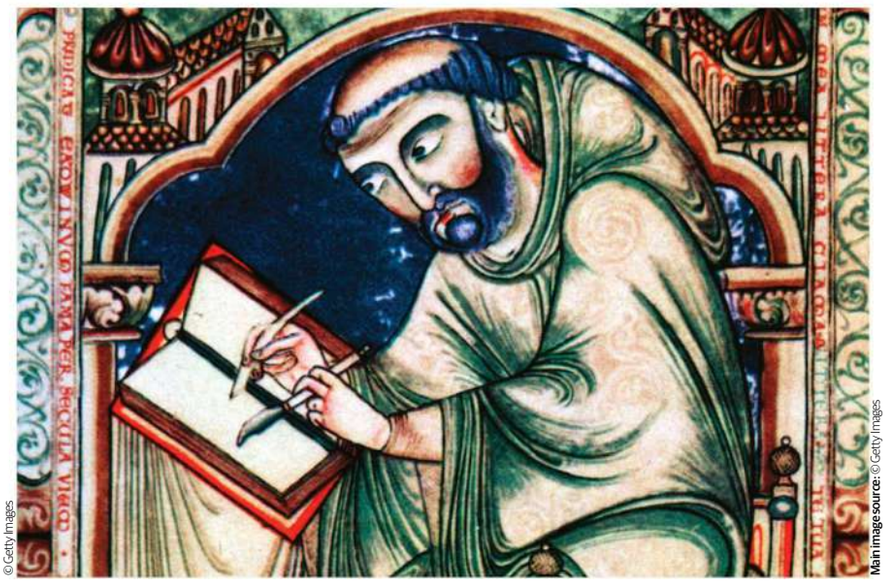
Johannes Gutenberg's invention, the printing press with moveable type, was the solution to a well-known problem: how best to exploit a growing market in books? It was a race, and in 1455, with the printing of his Bible, Gutenberg won. But it was a close-run thing.

In the early 15th century, when Gutenberg was young, the production of books had brought Christians ever further and ever faster out of the dark ages that had clouded Europe after the fall of the Roman Empire. Produced by scribes, books – most of them religious – were easier to read with brightly coloured capitals and chapter divisions. As trade links grew and towns evolved, ordinary people wanted schools and books for their children. The rich built libraries and needed books to fill them. Similar demands came from new universities. Latin was the language of the Church, but increasingly people wanted information in their own language: instruction manuals, verses, histories, legends. Europe was on the verge of the Renaissance.

But scribes were slow and expensive. So, books were also printed in a simple way, with wood blocks engraved in reverse then smeared with ink, and covered with paper, which was pressed firmly to transfer the image.

This sort of printing had been around for some 2,000 years. In ancient Egypt, scribes used wooden blocks to stamp common hieroglyphic symbols. In China, wood-block printing had been common from the 5th century on. Printing with moveable type was an obvious next step. In China, this was actually done, but the labour involved – making and using tens of thousands of stamps – was not worth the effort.

In 15th century Europe, would-be printers had to deal with only 26 letters – well, more than twice that actually, when you add capitals and punctuation. And the idea of making letters in metal had long been a possibility, based on the art of punch-making, the engraved metal tools used to 'strike' coins and medals. So, it was clear to some that it should be possible to print with movable type – if



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Main image source: © Getty Images

RIGHT
Johannes Gutenberg is universally recognised as the father of mass printing in Europe

Down With
Free
Fro
We
Do The
WRITE
Thing
QUILL
Overcome

THE PAST

PRE 15TH CENTURY

EARLY PRINTING

The printed word was nothing new and predates Gutenberg by centuries. The use of moveable wooden blocks of individual letters or characters was certainly familiar to the Chinese, and later the Koreans. But the main obstacles to overcome were time, technology and money. The speed at which pages could be produced, and the quantities achieved, meant the process remained very niche. But 15th century Europe was different. There was a market and a huge demand for information that could be circulated widely and more quickly. Into this environment stepped Gutenberg.

1455

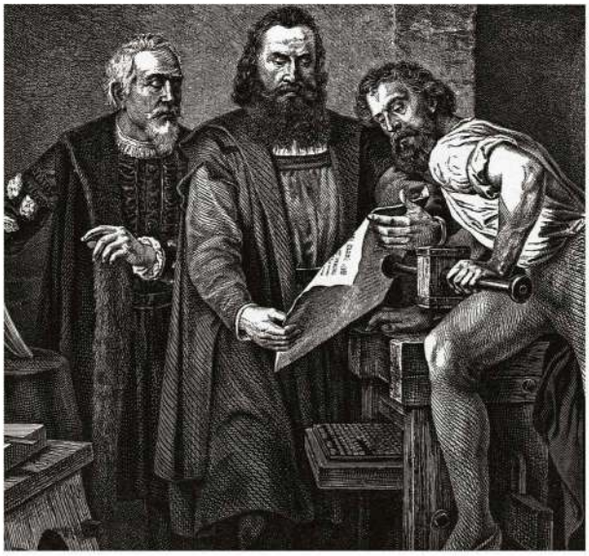
THE FUSE IS LIT

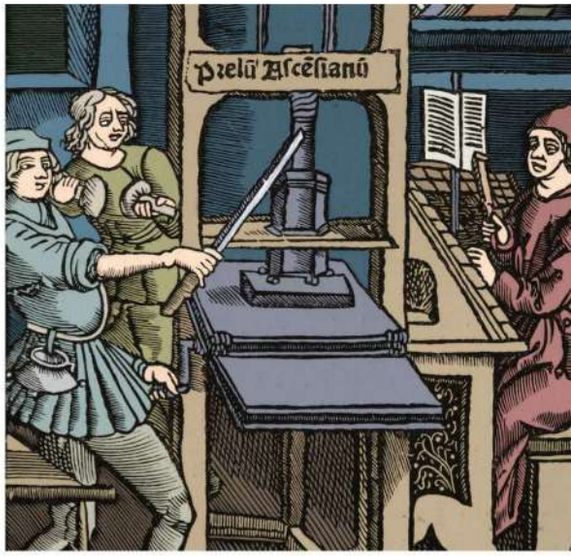
Having been working on his printing press in considerable secrecy, it is in 1455 that Gutenberg is able to release to the world the fruits of his labour. Variously known as the Gutenberg Bible and the 42 Line Bible, it is generally accepted as the first mass-produced printed publication. Of the possible 180 copies of the Gutenberg Bible that were printed – some on paper and others on expensive vellum – this may have taken up to three years to complete; but still much faster than traditional scribes! However, the genie was out of the bottle and the momentum in mass production of printed books and pamphlets could not be stopped.

1468

THE WORLD EXPLODES

By the time Johannes Gutenberg died in 1468 printing was already becoming an industry in its own right, and an essential part of social, political, and religious life. His endeavours did not make him rich. The debts he accumulated in following his dream would never leave him and he died in poverty. But what he had started enabled others to feed the voracious appetite for information and learning that was sweeping through Europe. By 1476 William Caxton had set up his printing press in Westminster, London, and the first book in English was produced. The mystery of the written word was to be shattered.





only one had a system to make the type, and then somehow include the type in a printing press.

From about 1440, printing was an idea that was in the air, and at least two men were working on the problem. Unfortunately for us, they treated their work as an industrial secret, and the evidence of their progress owes as much to legend as hard evidence.

One was a German goldsmith with the charming name of Procopius Waldvogel ('Wood-Bird'). Equipped with two steel alphabets and some sort of frame, he offered to teach the 'art of artificial writing.' He vanished without a trace. In Haarlem, Netherlands a block maker called Laurens Coster made letters from tin and lead and actually printed books, until (so the story goes) a faithless apprentice named Johann made off with the 'entire apparatus of types and tools and equipment'. There are still those who claim – against overwhelming evidence – that Coster was the real inventor, and that the apprentice was in fact Gutenberg.

In brief, in the 1440s, the elements were all in existence, and several people knew what needed to be done. If they had been successful, they would have cornered a growing market, and Gutenberg would have vanished into obscurity.

ABOVE-LEFT
Gutenberg needed the finance of partners to realise his ambitions

ABOVE-RIGHT
The speed of the process would increase over time

Would there have been any winners from the non-development of the printing press?

Yes, indeed: the Europe-wide armies of scribes. For half a millennium, they had served the cause of book production. As Christianity spread across the post-Roman world, monasteries arose to spread the Word, each needing copies of the Bible, prayer books and calendars, with each new sect – Cistercians, Benedictines, Dominicans – building new monasteries with new demands for books. Almost all had their own *scriptorium*, like the one run by Dieter Lauber in Hagenau, 25 kilometres north of Gutenberg's workshop outside Strasbourg. It was a good-sized business with teams of scribes, illuminators, rubricators (who devised coloured capitals), preparers of vellum (calf leather) and paper pages, binders, ink-makers, quill-makers, and more.

The work of the scribe was gruelling. A scribe, leaning over a candle-lit desk, would be hard-pressed to copy more than two high-quality pages a week. One 1,272-page commentary on the Bible took two scribes five years (1453-8) to complete, by which time redundancy loomed.

In 1454, someone – perhaps Gutenberg himself – was selling the first run of the Bible in Frankfurt and scribes by the thousand were about to be put out of work over the next 50 years. (Not so, however, their regiments of back-up workers, for the book trade would still need vellum, paper, and ink to supply the new type-founders and printers.) Scribes even copied printed typefaces, which quickly evolved away from their scribal roots, in an attempt to hold back the flood, to no avail.

Without Gutenberg's press, scribes all across Europe would have continued in their labours, proud of their ancient skills, even if unhappy with their conditions.

What would have been the economic consequences across Europe of having no mass printing?

A revolution would not have taken place. And what a revolution! For a few years, Gutenberg's books were as expensive as hand-copied ones. But the secret was out, the market was hungry, printing spread and prices dropped. Germany proved an ideal base, with its mines, metal workers and eager investors. In the 1450s, Gutenberg's protégés set up presses in their home towns. In the 1460s,

apprentices scattered, founding works in Cologne, Basel, Augsburg and Nuremberg. By 1500, 60 German cities had some 300 printing works. Strasbourg alone had 50.

From Germany, the revolution exploded outwards, exponentially, as every worker trained ambitious apprentices, eager to set up on their own. By 1480, eight other countries had towns with printers – 122 in all, almost half of them in Italy. The numbers doubled again in the next 20 years. Their products boomed in proportion. By 1500, 250 towns, many with more than one printer, had produced some 30,000 titles. Europe's printing capital was Venice, with 150 presses, the seedbed of Renaissance publishing.

The industry supported an ever-growing army of workers. The master-printer emerged as a social force, controlling finance, authors, proof-readers, punch-cutters, type-founders, pressmen and salesmen, with feed-backs from universities, as academics and scientists learned to check their own writings against each other. The printing press seized these creative forces and catapulted them across the face of Europe.

Had Gutenberg failed, had scribes remained the source of books, a whole new industry would not have come into existence. The course of European and world history would have been different.

What would have happened to religion in Europe if Gutenberg had failed?

Gutenberg, with an eye to profit, was inspired by the potential market in religious books. The Catholic church was in dire need. It was divided by competing sects and beset by Bibles and prayer books with errors duplicated by scribes. He had contacts within the church and would have been encouraged in an endeavour that promised mass-produced copies without errors and, in the long run, Rome's undisputed sway. But it all backfired spectacularly.

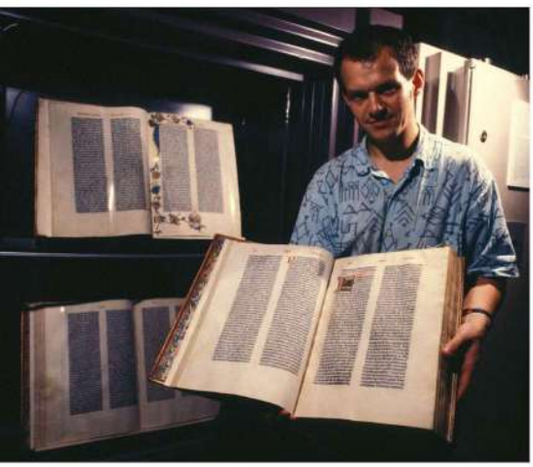
In 1511, an irascible and austere German monk, Martin Luther, went to Rome and was appalled by what he saw: licentiousness, depravity, poverty, and the church's gross luxury. Rather than follow a corrupt Pope and a decaying priesthood, he preferred to commune with God directly. He put his objections and proposals in the form of 95 bullet points ('theses') which, in autumn 1517, were leaked to the local printer in Wittenberg – the story that Luther nailed them to a church door is a legend. A few weeks later, editions of the 'theses' appeared in Leipzig, Basel and Nuremberg, and Luther became famous nationwide. It's said that the noises that accompanied Luther's message were hammer blows. A better image is that the noises were the squeaks and bangs of printing presses.

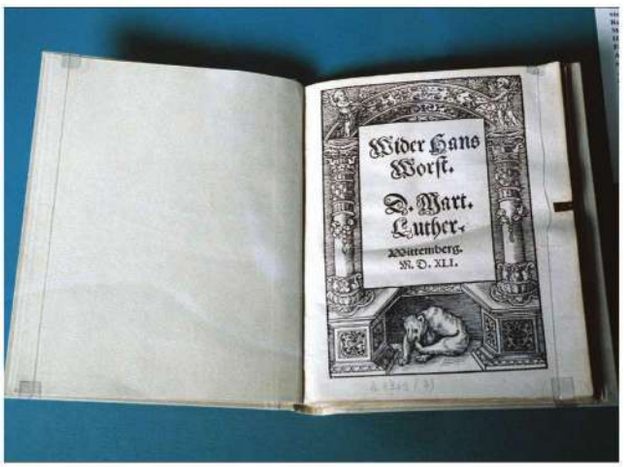
So began the Reformation: Europe would divide, with a century of war. But first came bitter controversy. The church fought back, Luther dug in, issuing sermons, texts and polemics, reproduced by the hundred thousand by printing presses. He became a publishing phenomenon. One third of all books published in Germany between 1518 and 1525 were by him – estimated sales of 300,000 books. His most powerful was his *Address To The Christian Nobility Of The German Nation*, in effect a Reformation manifesto, which appeared in 13 editions in two years. The Reformation was the child of the printing press.

It is inconceivable that such an effect could have been achieved by scribes. If Gutenberg had not succeeded, we would be in a different universe – no Reformation, only a slow-motion protest by an angry monk, easily countered by a powerful papacy, no Protestantism in its several forms, no English break with Rome, no Anglican church.

BELOW-LEFT
It is believed there are 40 surviving copies of the Gutenberg Bible

BELOW-RIGHT
Martin Luther's mass-produced pamphlets turned him into a bestseller





THE POSSIBILITY

15TH CENTURY

A DARK CLOUD OVER EUROPE

With the knowledge of reading and skills of writing nestled comfortably in the hands of educated scribes and scholars, without the pivotal invention of Gutenberg's press very little may have changed, or at least progress would have been painfully slow. It had always been in the interest of those in power to use people's ignorance as a weapon against themselves. It is through control of the message and the meaning that people in turn are controlled, and so it would have continued to be in a Europe kept in a dark age instead of released into enlightenment.

1517

MARTIN WHO?

When Martin Luther revealed his 95 theses in 1517, he unleashed a wave of change and reform. But without the power of the printing press, it may have remained an isolated rant, a local incident, by a local priest. Instead of words becoming news, and news emerging into print, challenging authority and influencing thousands through the printed word, there may have been no Reformation. Without the speed, spread and permanence that the printed word could give, Luther's actions and his words may well have quickly melted into hearsay and been quickly forgotten.

1534

HIS MOST CATHOLIC MAJESTY

It is understood that Henry's second wife, Anne Boleyn, possessed a printed copy of William Tyndale's explosive book, *The Obedience Of A Christian Man*. It is from this book that the desperate Henry interpreted his actions in the annulment of his marriage to Catherine of Aragon and his split with Rome. Printing made the book readily available, and its widespread publication fuelled substantial support for its message. Without that support Henry may have been less convinced about his argument. Anne may not have been able to exert the same influence, and Henry may have stepped back to remain a devout Catholic Prince.

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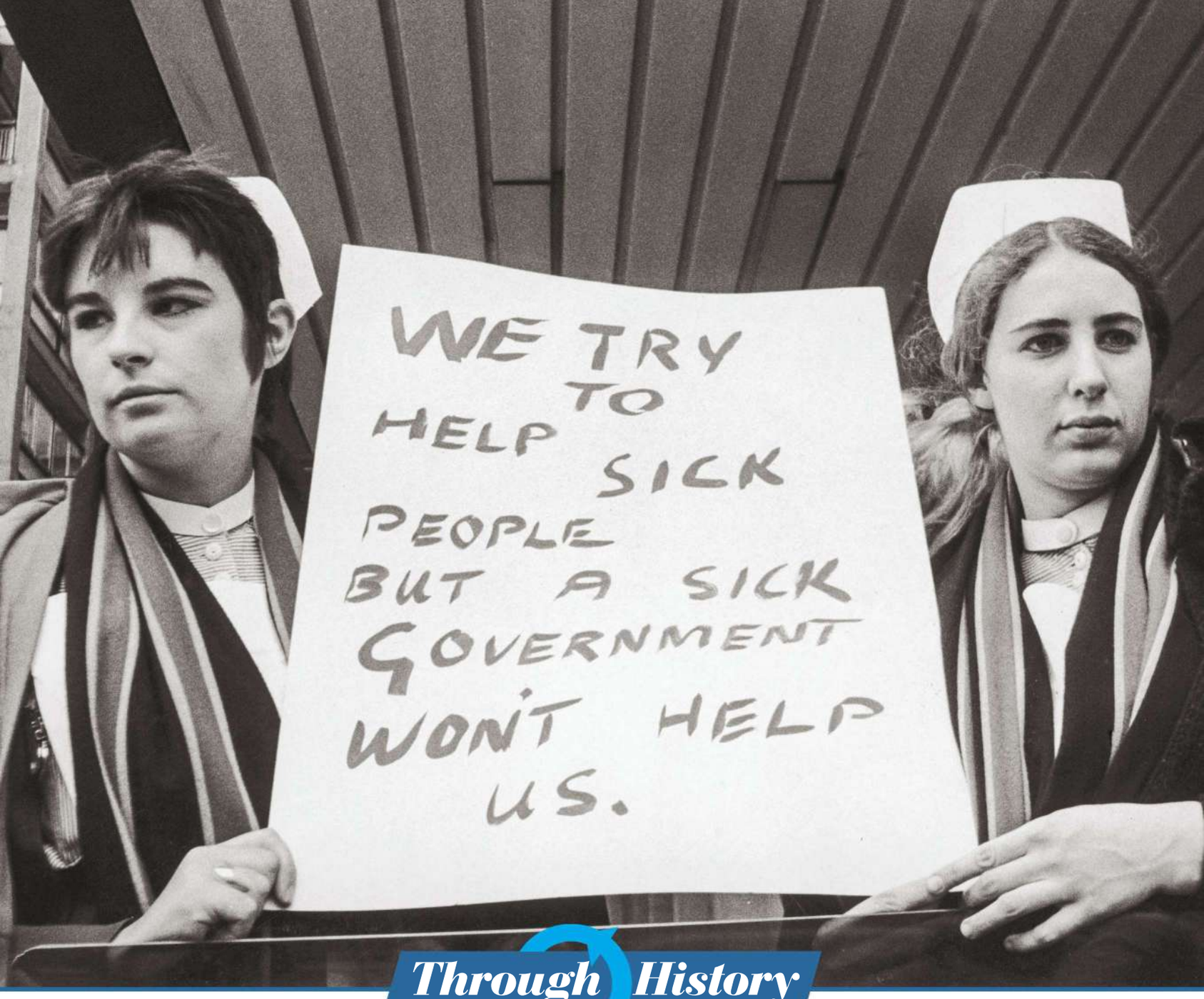


Through History

CELEBRATING THE NHS

A new book commemorates 75 years of the National Health Service in Britain

All images courtesy of: The NHS (Hoxton Mini Press, 2023)

Britain's National Health Service (NHS) came into existence on 5 July 1948 and its establishment ensured that all Brits had access to free healthcare, regardless of their personal circumstances. The idea for a state-run medical service had been in the works since the beginning of World War II, but it was during the post-war period, when Britain was recovering from the conflict, that economist William Beveridge's 'social policy' began to be put into motion by Labour health minister Aneurin Bevan. The founding of the NHS was not simple, with many doctors and nurses sceptical of the system, but Bevan worked to ensure all parties were on board with the idea.

Now, the NHS is celebrating its 75th anniversary. The organisation, founded to create a better standard of accessible healthcare for all, has proved its worth for all that time, most recently during the COVID-19 pandemic when NHS staff risked their safety to care for the ill. In honour of its anniversary, a new book, published by Hoxton Mini Press with an introduction by Lucy Davies, celebrates the staff of the NHS through a series of photographs from the 20th century that highlight the highs and lows of the institution's history.

RAISE THE ROOF

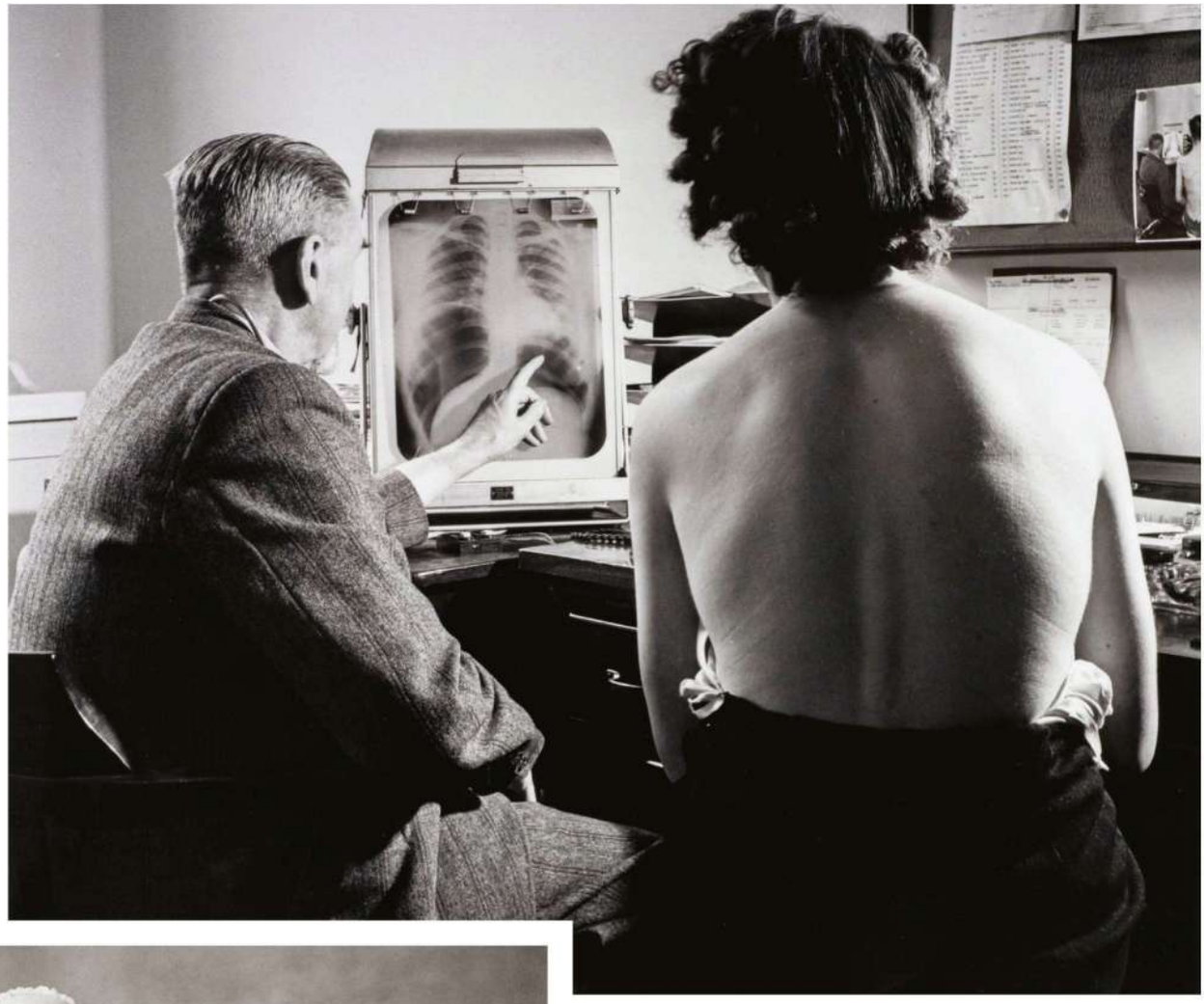
The year 1969 saw NHS nurses petition the government for fair pay in the 'Raise the Roof' campaign. The campaign was supported by the British public, with more than one million letters regarding the issue sent to the Secretary of State for Health and Social Security.

DIAGNOSTIC TOOLS

In this photograph, a doctor reviews an X-ray of a woman's chest. Under the NHS, X-rays were used to diagnose tuberculosis, a disease that killed 25,000 people a year in Britain before 1948.

BABY LOVE

These nurses are holding three babies born on 5 July 1948 – some of the very first babies to be born under the new National Health Service. Before the founding of the NHS, parents had to pay one shilling and sixpence for aid in having their babies.



DIVERSE STAFF

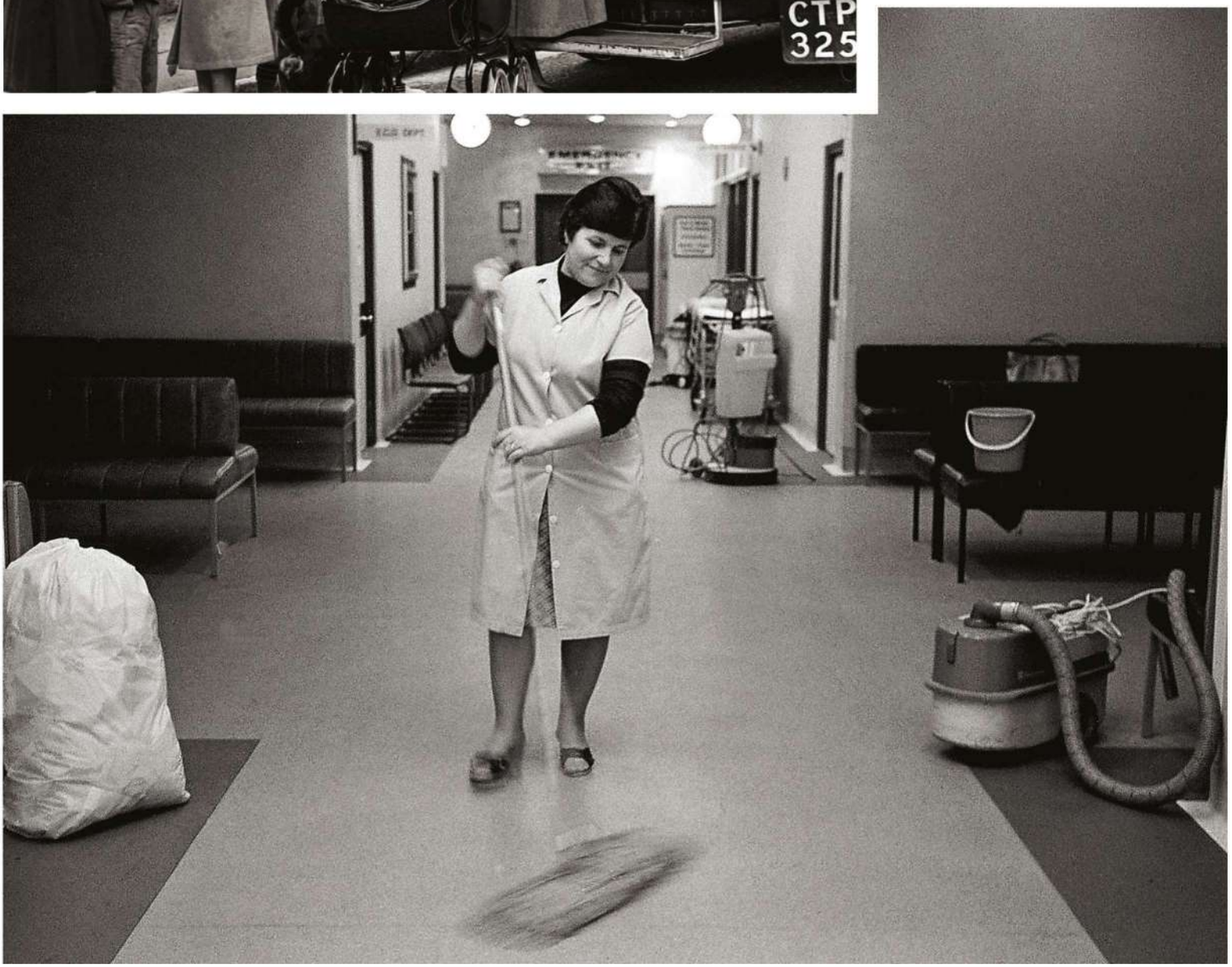
With a shortage of nurses in Britain, the NHS recruited from across the Commonwealth and the Caribbean to staff their services. This photo shows a Nigerian nurse working at a hospital in London. Over 200 nationalities make up NHS staff today.

VACCINATION

Vaccination strategies were at the core of the NHS when it was first established. Providing immunisation against diseases like polio and diphtheria meant that within the first ten years of the NHS, these illnesses all but disappeared from Britain.

HIDDEN HEROES

This photograph shows a hospital domestic worker in the 1980s. Over 40 per cent of NHS staff are ancillary workers who do vital work in keeping hospitals running. These people are some of the worst paid in the country, despite the critical work they do.

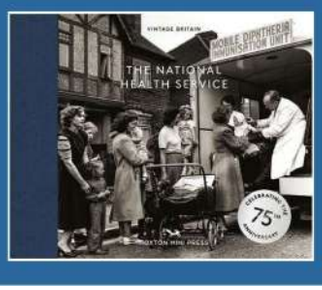


SUN-LAMP THERAPY

These children are shown being exposed to sun-lamp therapy. This treatment was believed to help cure a variety of conditions, including chest infections and acne. At the time, it was not known that exposure to UV rays could cause skin cancer.

GROUNDBREAKING SURGERIES

In 1968, the first heart transplant in Britain was undergone by Frederick West at the National Heart Hospital in London. He is pictured here surrounded by the nurses of the hospital after his transplant. Unfortunately, he only survived for 45 days.



The National Health Service (Hoxton Mini Press, 2023) is available to buy now.

REVIEWS

The books, TV shows and films causing a stir in the history world this month

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THE GALLOWS POLE

A rollicking crime caper set in 18th century rural Britain

Director: Shane Meadows **Cast:** Michael Socha, Sophie McShera, Samuel Edward-Cook **Released:** Out now

Shane Meadows has described his new three-part series as a prequel to Benjamin Myers' award-winning work of historical fiction, *The Gallows Pole*. Published in 2017 to rave reviews, it won the coveted Walter Scott Prize. While workshopping with the cast, Meadows told the press recently, he realised there was more story to tell about the origins of what is said to be the biggest criminal scam ever committed in this country. His decision to switch focus produced a brilliant television companion piece to the hit novel.

In mid-18th century Yorkshire, a group of unemployed weavers and destitute farmers got their hands on a purloined coining kit and clipped real coins. They smelted the gathered clippings together to produce new, fake, money, and then flooded the local area with these counterfeit creations (coins so finely detailed, only experts could tell the difference). This gang is known to history as the Cragg Vale Coiners.

Seeking to draw parallels between people on their knees in 18th century rural Yorkshire and life today in Britain, this entertaining yarn about working-class collective action depicts an impoverished community, whose lives are directly controlled by the whims and meagre opportunities doled out by greedy types, deciding to act in their own interests for once. Beleaguered folk finding their voices again – from lambs to lions – after years of being run into the ground by the elites. It makes old true-life stories relevant, showing history moving in circles, not necessarily progressive straight lines.

Commencing just as the Industrial Revolution kicked into gear, when bucolic idylls and agrarian spaces transformed into "dark Satanic mills", eventual ringleader 'King' David Hartley (Michael Socha) returns home to Cragg Vale with a knife wound in his belly and a mission to deliver social justice. Having survived death, David, an antihero looking for redemption, oversees the beginnings of a criminal enterprise and seeks to mend broken relationships with his two brothers, a sister, and abandoned wife Grace (a superb Sophie McShera).

This is not your standard-issue BBC period adaptation. Meadows clearly references the acid and spaghetti western cult subgenres (the opening shot, movie fans will notice straight away, is a homage to 1966's *Django*), as well as bringing in elements of folk horror and beloved Ealing comedies. The psychedelic rock score fits like a glove too, capturing in music the swagger and all-or-nothing sense of purpose that Hartley and his motley crew exude as they enact their masterplan. Socha's charismatic and troubled Hartley is not just a class-avenging schemer, either, but a peasant William Blake, guided by visions and messages delivered in dreams by cloaked men with stag skulls for heads. He also has the air of the gunslinger from the Wild West about him; back in town to clean up the place.

A surprising, lively, fiercely anachronistic take on the acclaimed source material, the Cragg Vale Coiners risked their necks acting out of necessity, not greed. It's a crucial difference. ***MC***

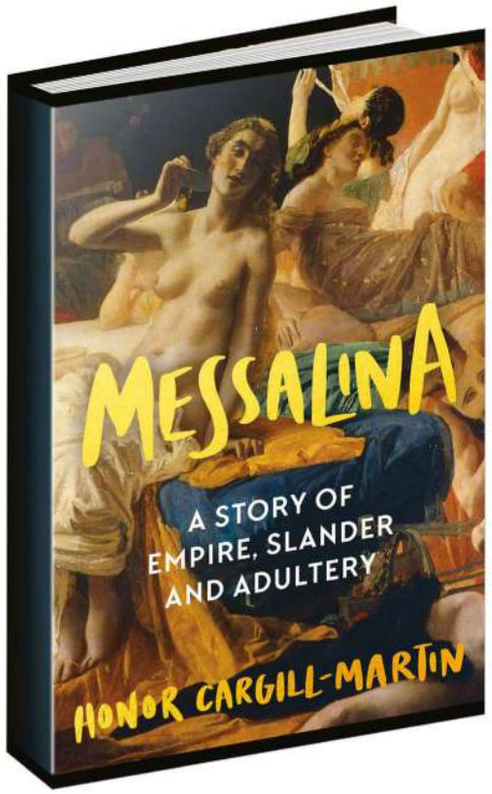
★★★★★

Reviews by
Martyn Conterio, Mallory James, Catherine Curzon

MESSALINA: A STORY OF EMPIRE, SLANDER AND ADULTERY

Explore the captivating world of the Julio-Claudian dynasty

Author: Honor Cargill-Martin **Publisher:** Head of Zeus
Price: £27.99 **Released:** Out now



With wild parties, scandalous affairs, ships sailing into exile and brutal, horrifying ends, *Messalina* highlights both the glamour and the terror of the Roman imperial court. At its core is Valeria Messalina; a woman whose name has become infamous.

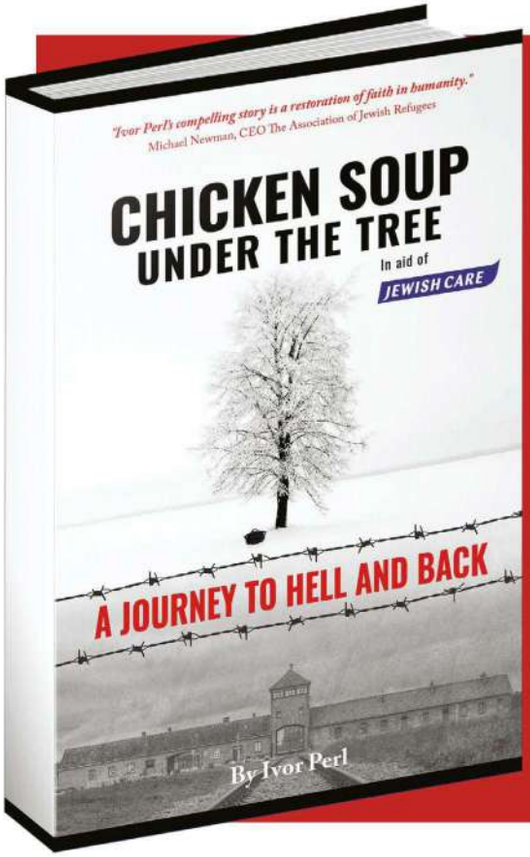
Honor Cargill-Martin deftly builds a thoughtful re-examination of Messalina's life, challenging objectified and sexualised narratives. The third wife of Emperor Claudius, Messalina's rise and fall is carefully pieced together and explored. Readers are taken through the details of estimating the year of her birth, to her political and dynastic strategies, to her distressing death following accusations of bigamy and adultery in 48 CE. It makes for engrossing, thought-provoking and, at times, uncomfortable reading.

However, as a meticulous and comprehensive account of the world that shaped Messalina, and that she then shaped in turn, this book will have a natural appeal to those that are interested in the wider history of the Julio-Claudian dynasty and Roman imperial life. The reigns of Augustus, Tiberius, Caligula and Nero are considered. However, *Messalina* also sheds light on the lives of other Roman women operating across this period, including Livia Drusilla, Agrippina the Younger and Arria.

Yet *Messalina* considers not only the empress' life, but also her afterlife in memory. This extends from the *damnatio memoriae* following her death – where her portrait was scrubbed away and her statues smashed – down the centuries to her representation in modern media.

A wide-ranging and powerful work, *Messalina: A Story Of Empire, Slander And Adultery* should certainly find a broad readership. ***MJ***

★★★★☆


"Ivor Perl's compelling story is a restoration of faith in humanity."
Michael Newman, CEO The Association of Jewish Refugees
CHICKEN SOUP UNDER THE TREE
In aid of
JEWISH CARE
A JOURNEY TO HELL AND BACK
By Ivor Perl

CHICKEN SOUP UNDER THE TREE

A harrowing and inspiring story of survival

Author: Ivor Perl **Publisher:** Lemon Soul **Price:** £8 **Released:** Out now

When Ivor Perl was just 12 years old, he and his family were thrown out of their home, loaded into a cattle truck and taken to Auschwitz. It was the start of a harrowing journey during which Ivor lost both of his parents and nearly all of his siblings. Only he and his older brother, Alec, survived the Holocaust.

Chicken Soup Under The Tree states at the start that it is not a story, but the personal testimony of Ivor Perl, both before and after Auschwitz. In this remarkable, deeply moving book, Perl takes the reader on a heartbreaking journey into his life as an inmate of the concentration camp, as he struggled to survive against the horrors that were his daily life. Yet Perl did survive and his journey eventually brought him to a new life in England, where he started a family of his own, before making a journey back to the land of his birth.

This is a very short book, barely 100 pages, and it is richly illustrated with photographs from Perl's own collection. Despite its brief page count, however, it is an enormously moving and inspiring read. Written in Ivor Perl's conversational style and originally intended as a testimony for his family, reading *Chicken Soup Under The Tree* feels rather like sitting with the author and having him tell his story. It is, of course, not an easy read, but what emerges is a story of survival and humanity, in a time in which the latter seemed to be in short supply. ***CC***

★★★★★

Hitler's Elite

Since his radicalisation in the wake of Germany's WWI defeat, Hitler had desired a war that would secure the future of Germany and his idea of a 'pure' populace. But words and thoughts are one thing - actually conducting a war, required commanders, special units and formidable weapons. Discover the men and machinery that powered the Nazis to the brink of victory in WWII.

Buy *Hitler's Elite* in shops or online at **magazinesdirect.com Price:** £15.99

HISTORY OF WAR **RECOMMENDS...**

Bismarck's War

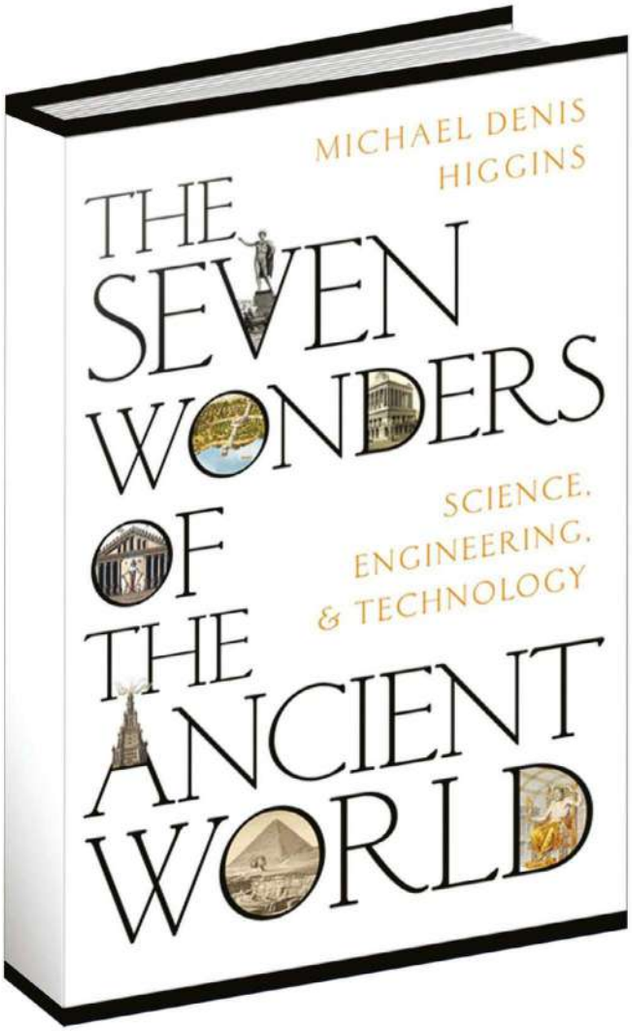
Author Rachel Chrastil **Price** £30 **Publisher** Allen Lane

Rachel Chrastil tells the shocking tale of the short-lived Franco-Prussian War and how it was deliberately engineered by soon-to-become Chancellor Otto von Bismarck who, almost without stopping to draw breath, went on to mastermind the unification of Germany. As Chrastil states, in the years that followed, European armies emulated the Prussians' example by expanding conscription, developing their general staffs, professionalising their military education and engaging in war games.

THE SEVEN WONDERS OF THE ANCIENT WORLD: SCIENCE, ENGINEERING AND TECHNOLOGY

A fascinating dip into ancient feats of endeavour

Author: Michael Denis Higgins **Publisher:** Oxford University Press **Price:** £22 **Released:** Out now



"What could be a dry topic is anything but, and Higgins' writing is rich in detail"

The Seven Wonders Of The Ancient World: Science, Engineering And Technology is a book that brings together ancient marvels and modern scientific research to provide readers with what is, essentially, a biography of each monument. The list of monuments included will be instantly familiar to most readers and are the Pyramids of Giza, the Hanging Gardens of Babylon, the Statue of Zeus at Olympia, the Mausoleum at Halicarnassus, the Temple of Artemis at Ephesus, the Colossus of Rhodes, and the Pharos Lighthouse at Alexandria. Only one of these wonders still exists, but Higgins closes the book with a chapter that considers the building of replicas, which Higgins terms his New Wonders, presented along with his own plans for how they would be built to withstand a projected lifespan of 2,000 years.

For centuries, researchers, archeologists and historians have drawn back the veil on these mostly lost wonders, attempting to explain not only why they were constructed, but crucially, how. In *The Seven Wonders Of The Ancient World*, Higgins wades into this debate in a rather unique fashion, bringing together ancient records, archeological research, and technological and scientific understanding to present a vivid, multi-disciplinary investigation. This is no builders' manual, nor a retreading of the well-told stories of the seven wonders, but a study that examines not only the expertise it took to build a wonder, but also the worlds in which they existed. Each wonder drew on a vast amount of knowledge, but also took money and human endeavour. Higgins presents readers with a portrait of the societies in which such endeavour could thrive, and the cost that building a wonder could exact.

Of course, six of these seven wonders no longer exist, and this is a fact that Higgins is keen to examine with as much detail as their creation. In each chapter, Higgins presents the wonder itself, examining its background and construction and, of course, its eventual demise. Though some of the sites have remained preserved or tantalising clues and hints of what was once there still exist, the book delves further into what part nature itself contributed not only to destruction, but to preservation too.

Higgins' text is supported by dozens of photographs, illustrations and maps that help contextualise the wonders, as well as provide fascinating insight into their construction and, perhaps, recreation. There are extensive references, for readers who might want to dig even deeper.

The Seven Wonders Of The Ancient World: Science, Engineering And Technology is a fascinating work and one that is eminently accessible. It is also extremely readable, requiring very little prior knowledge of the science and technology of the ancient world. What could be a dry topic is anything but, and Higgins' writing is rich in detail and evocative of the distant worlds in which the wonders existed. This book will no doubt appeal to a wide range of readers, and deservedly so. ***CC***

★★★★★

HISTORY VS HOLLYWOOD

Fact versus fiction on the silver screen

THE TRIALS OF OSCAR WILDE

Director: Ken Hughes **Starring:** Peter Finch, Yvonne Mitchell, James Mason **Country:** Britain **Year:** 1960

The story of the downfall of the famous playwright and consummate wit, jailed for his relationships with other men

VERDICT: A largely accurate, sympathetic and profoundly moving story of the downfall of Oscar Wilde.

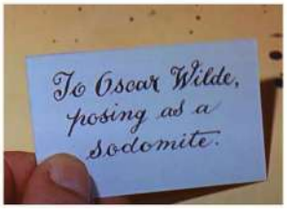
01 A libel trial results from a card left by the Marquess of Queensberry, who disliked Wilde's relationship with his son, Lord Alfred Douglas. The card in the film reads 'To Oscar Wilde, posing as a sodomite'. However, in reality, it was probably 'posing sodomite'.

02 Lionel Jeffries takes the role of John Douglas, 9th Marquess of Queensberry. Much is made of Queensberry's reputation as a fighter; though he did not devise the legendary Queensberry rules of boxing, they were in fact named in his honour.

03 The lawyer defending Queensberry is Edward Carson (played by James Mason). Carson and Wilde had indeed known each other as students, causing Wilde to comment: "No doubt he will pursue the case with all the added bitterness of an old friend".

04 When Wilde is arrested for gross indecency, Sir Edward Clarke (Nigel Patrick) offers to once again represent Wilde, this time for no fee. This is true, due to his disgust at the legal loopholes present in the case and some of the more salacious tactics used.

05 Oscar Wilde is informed that he will be given an allowance by his wife, as long as he does not see his children or Lord Alfred again. However, the pair did reunite in Naples, though the experience was reputedly not a pleasant one.



Main image: © Shutterstock
Screenshots: © Metro-Goldwyn-Mayer

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Did you know?

The original recipe tells us that Shell Bread was also sometimes referred to as the Italian Mussel.

Main image: © Alamy
Inset image: © Getty Images

SHELL BREAD

SWEET SHELL-SHAPED CAKES, ENGLAND, 1617 - PRESENT

Ingredients

- 3 tbsp plain flour
- 200g granulated sugar
- 3 medium eggs
- 3 tbsp double cream
- 1 lemon
- Pinch of aniseed
- 2 tsp rose water (with extra for icing)
- 3 tsp icing sugar
- Butter to grease tins
- Cleaned mussel shells (optional)

First found in the Stuart cookbook *A Daily Exercise For Ladies And Gentlewomen* by John Murrell, published in 1617, the recipe for Shell Bread is one of many sweet dishes included in the manuscript that records popular Stuart dessert dishes for banqueting. Shell Bread is not, in fact, a bread but several small cakes made in the shape of shells. To create the shell shape, the original recipe specifies that the cake batter should be baked in actual mussel shells. The final product looks akin to a French madeleine cake, which was first made in the 18th century.

METHOD

01 Preheat the oven to 180°C.
02 Zest the lemon.
03 Mix together the sugar, lemon zest, aniseed and two tbsp of flour in a bowl.
04 Separate the yolks from the whites of two of the eggs, keeping the yolks.
05 In a separate bowl whisk together one whole egg, the two egg yolks, cream and one tsp of rose water.
06 Add the dry ingredients to the wet ingredients and stir to combine into a cake batter.
07 Cover the bowl with cling film and put the batter in the fridge.
08 Melt the butter in a pan.
09 Add 1 tbsp of flour and 1 tsp of rose water to the melted butter and stir together.
10 Get your cleaned mussel shells, or madeleine baking tin if you want an easier option, and using a pastry brush coat the insides of the shells with the butter mixture.
11 Take the cake batter out of the fridge and place it into the shells.
12 Bake the shells in the oven for up to 20 minutes or until golden brown.
13 Once baked, cool the shells and once cooled remove them from the tin.
14 In a small bowl, mix together the icing sugar with a little rose water until a glaze is formed.
15 Drizzle the glaze over the shells and then serve.

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